

F00574

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey: Field Examination

Registry Number: F00574

LOCALITY

State: Maine

General Locality: Offshore York Harbor,

Sub-locality: 3 NM SE of York Harbor

2009

CHIEF OF PARTY
CDR Shepard M. Smith
NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

F00574

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: **Maine**

General Locality: **Offshore York Harbor**

Sub-Locality: **3 NM SE of York Harbor Entrance**

Scale: **1:10,000** Date of Survey: **10/1/09 to 10/5/09**

Instructions Dated: **21 September 2009** Project Number: **S-A936-TJ-09**

Vessel: **NOAA Ship *Thomas Jefferson***

Chief of Party: **CDR Shepard M. Smith , NOAA**

Surveyed by: ***Thomas Jefferson* Personnel**

Soundings by: **Reson 7125 & 8125 multibeam echo sounder.**

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

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

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

Verification by: ***Atlantic Hydrographic Branch***

Soundings in: **Meters* *feet* at MLLW**

Remarks:

- 1) All Times are in UTC.***
 - 2) This is a Navigable Area Hydrographic Survey.***
 - 3) Projection is NAD83, UTM Zone 19.***
- Bold italic red notes in the Descriptive Report were made during office processing.***

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Descriptive Report to Accompany Hydrographic Survey F00574

Project S-A936-TJ-09
 Gulf of Maine, ME
3 NM SE of York Harbor Entrance
 Scale 1:10,000
 October 1–5, 2009
NOAA Ship *Thomas Jefferson*

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions S-A936-TJ-09*, dated 21 September 2009. **Submitted with original field records.*

North Western Limit	South Western Limit	South Eastern Limit	North Eastern Limit
43°07'05.53" N 070°36'20.21" W	43°06'02.48" N 070°36'19.92" W	43°06'33.45" N 070°35'06.57" W	43°07'06.73" N 070°33'56.25" W

Data acquisition was conducted on October 1st and October 5th, 2009.

The purpose of this project is to acquire bathymetry over an area with sparsely charted soundings to (1) update the charted area and (2) to provide data to UNH/CCOM to aid a study of the uncertainty in water depth in areas represented on a chart where the water depths have not been measured. The survey of the new UNH/NOAA pier face was added to this project on 5 Oct 2009, after the project instructions* were issued (appendix V). **Amended Project Instructions were not submitted with original field records.*

	Linear Nautical Miles
LNM Single beam mainscheme only	N/A
LNM Multibeam mainscheme only	87.79
LNM Lidar mainscheme only	N/A
LNM Side Scan Sonar mainscheme only	0.15
Lineal nautical miles of any combination of the above techniques (specify methods)	87.79
LNM Crosslines singlebeam and multibeam combined	11.5
LNM Lidar Crosslines	N/A
LNM development lines non mainscheme	N/A
LNM shoreline/nearshore investigations	0
Number of Bottom Samples	0
Number of items investigated that required additional time/effort in the field beyond the above survey operations	0
Total number of square nautical miles	1.89

Table 1: Hydrographic Survey Statistics



Fig. 1. F00574 Survey Area.

Calendar Date	Julian Day
1-October-09	274
5-October-09	278

Table 2: MB Acquisition Dates

B. DATA ACQUISITION AND PROCESSING

Refer to *S-A936-TJ-09 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 included in this descriptive report. **Submitted with H-Cell deliverable.*

B 1. EQUIPMENT AND VESSELS

Data were acquired by NOAA Ship *Thomas Jefferson*, *Launch 3101* and *Launch 3102*. NOAA Ship *Thomas Jefferson* acquired Reson 7125 multibeam echo sounder soundings and sound velocity profiles. HSL 3101 & 3102 acquired Reson 8125 & 7125 multibeam echo sounder soundings, respectively, and sound velocity profiles. Vessel configurations, equipment operation and data acquisition and processing were consistent with specifications described in the DAPR*. **Submitted with H-Cell deliverable.*

B 2. QUALITY CONTROL

B 2.1 System Certification and Calibration

Refer to NOAA Ship *Thomas Jefferson's* DAPR* and Hydrographic Systems Readiness Report (HSRR)** for a complete description of system integration and initial calibration results for equipment and sensors used for this survey. **Submitted with H-Cell deliverable. **Memo on file at the Atlantic Hydrographic Branch.*

B.2.2 Sounding Coverage

As per the Letter Instructions, this survey was conducted using complete coverage multibeam. Bathymetry coverage over the primary survey area was monitored by creating a single BASE surface with 1 meter resolution, as per HTD 2009-2 for Complete Multibeam Coverage in depths less than 20 meters. This exceeds the resolution requirements in areas deeper than 20m, so no lower resolution surface was created. The complexity of the terrain of the primary area is better represented by a single higher resolution surface than multiple threshold surfaces. As a result of data cleaning, a swath of no coverage approximately 15 meters in length and 5 meters in width exists in the vicinity of 43-06-16.42N, 070-35-11.18W. No significant features exist in this area.

Concur with clarifications. As per HTD2009-2, a 1 meter resolution grid is appropriate for depths less than 23 meters. For depths within the survey area that are between 20 meters and 52, a 2 meter grid is appropriate. Therefore, depth grids were depth thresholded into two surfaces (0 – 23m and 20 – 50m) at the Atlantic Hydrographic Branch to preserve appropriate resolution.

Bathymetry coverage over the pier area was monitored by creating a single BASE surface with 50cm resolution. As per guidance from AHB, data along pier faces were edited to a distance extending 1 meter beyond the observed supporting piles. Figures 2 and 3 below show the pre and post editing of the survey data. *Concur with clarification. The charted pier was removed between 2006 and 2007 and subsequently rebuilt to house the new NOAA Survey Vessel Ferdinand Hassler. The currently charted pier should be removed and the SLCONS pier based on the multibeam bathymetry from this survey charted in its place. *See also Appendix V.*

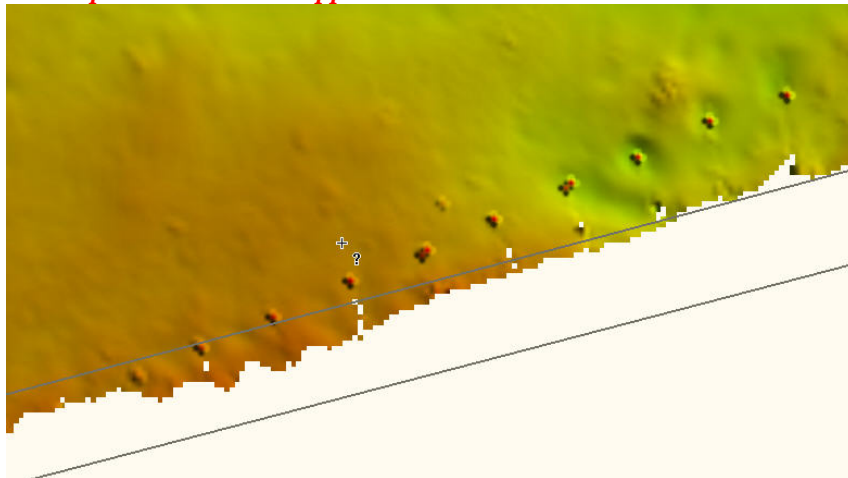


Figure 2: Fort Constitution pier pre data cleaning

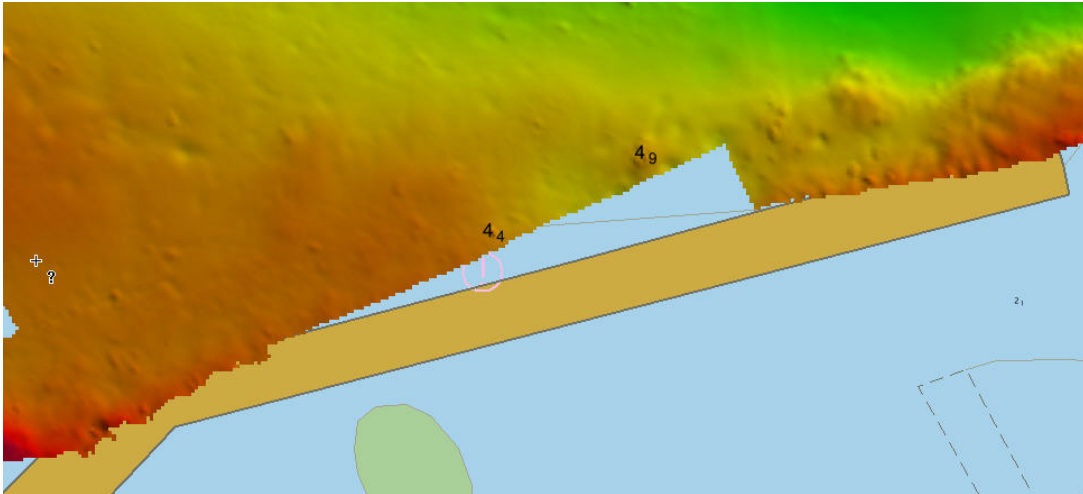


Figure 3: Fort Constitution pier post data cleaning

B 2.3 Crosslines

Multibeam echosounder cross-lines totaling 11.5 lineal nautical miles, comprising 13% of the multibeam hydrography, were acquired during the course of the survey. As per email dated 10 Sept 2009 from AHB*, the quality control check was done using the standard deviation layer of the survey's CUBE surface. Standard deviation values higher than 0.4m were investigated and resolved in processing, except where caused by areas of high bathymetric relief or features or as described in Section 2.5 Systematic Errors. **Submitted with original field records, see Appendix V. Although the investigation of the standard deviation layer is not a standard practice, an office QC determined that the uncertainty associated with the depth grids met IHO and NOS specifications.*

B 2.4 Junctions and Prior Surveys

No contemporary surveys junction with F00574.

B 2.5 Systematic Errors

In general, standard deviation values between launches 3101 and 3102 do not exceed 20 cm across the survey area (Figure 4). Areas of higher standard deviation are generally a result of rapid changes in bathymetry in the primary survey area. *Concur.*

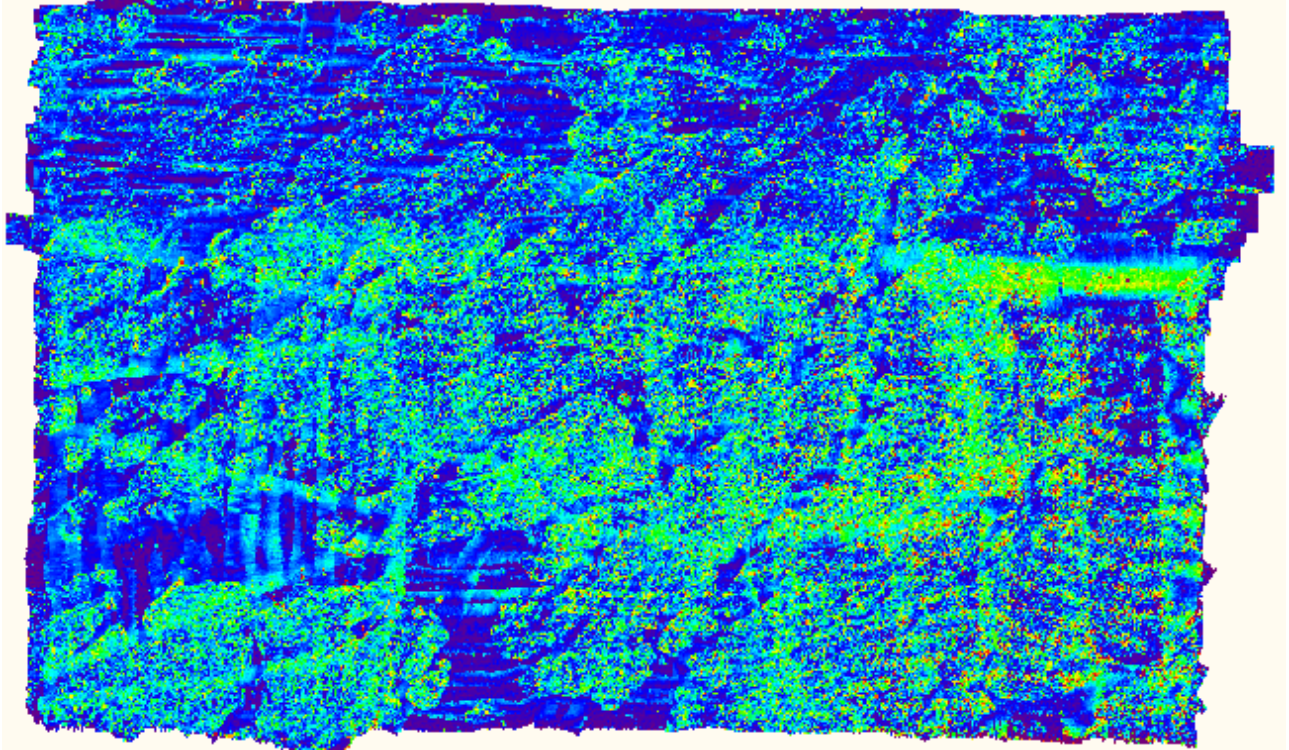


Figure 4: F00574 Standard Deviation between Launches. Red $\geq .4m$

Some areas of the primary survey area show data density at the 1 meter grid size of less than 5 soundings per node (Figure 5). In general this does not affect the adequacy of the survey as this is in areas greater than 20 meters depth, which would have been gridded at 2 meters resolution. *Concur.*

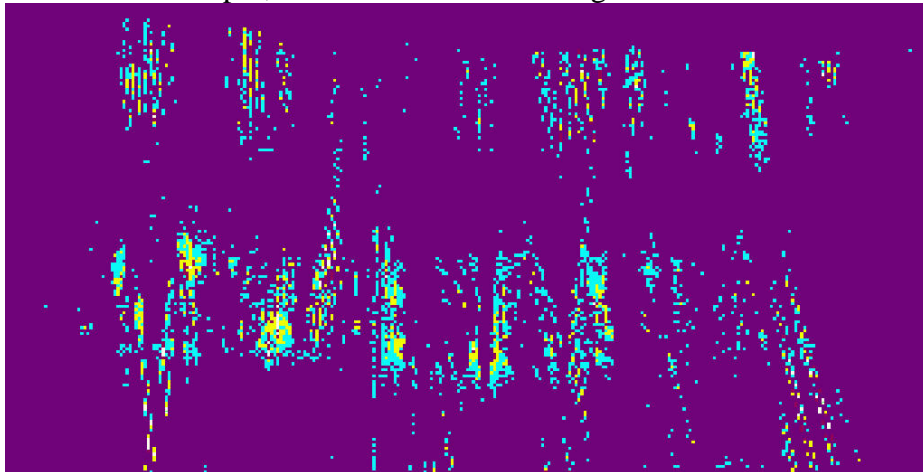


Figure 5: Areas of data rarification.

B 3. CORRECTIONS TO ECHO SOUNDING

HDCS sounding data were reduced to mean lower-low water (MLLW) using verified water levels from Fort Point, NH 842-3898 and corrected using final zoning provided by CO-OPS and illustrated in figure 6.

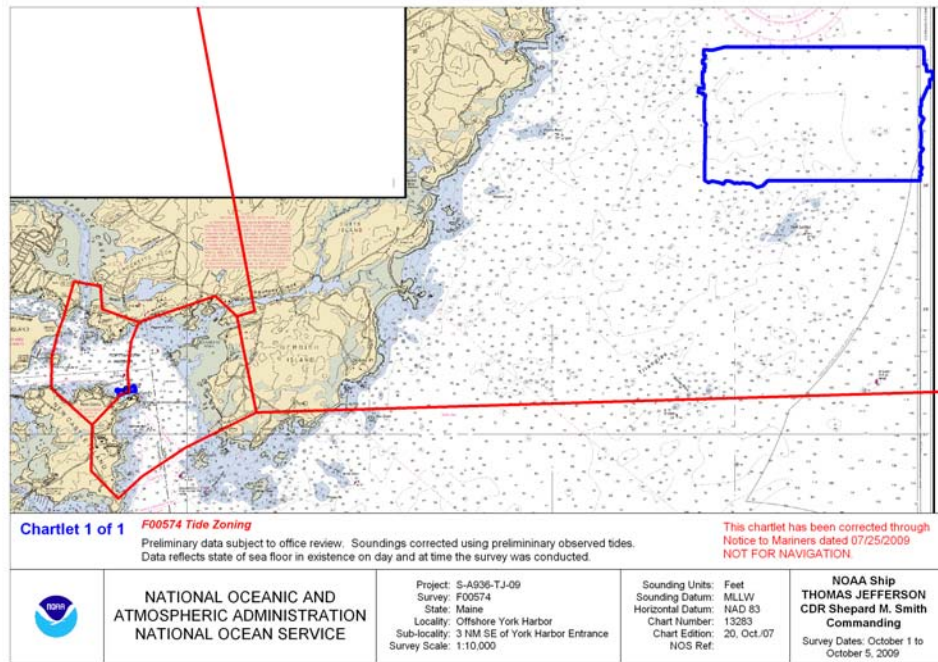


Figure 6: Final Tide Zoning

All other datum reduction procedures conform to those outlined in the DAPR*.

All methods and instruments used for sound velocity correction were as described in the DAPR*. A table detailing all sound velocity casts is located in Separate II* of this Descriptive Report. Application in CARIS HIPS was nearest in time. **Concur. *Submitted with H-Cell deliverable. **Submitted with original field records.**

B 4. DATA PROCESSING

B 4.1 Total Propagated Error

For the 2009 field season, Total Propagated Error (TPE) parameters for sound speed and tides are calculated separately for each project. As per the WATER LEVEL INSTRUCTIONS (Appendix 4*) provided by Co-Ops: ***Appended to this report.**

Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of Offshore York Harbor, ME cannot be computed due to a lack of available water level time series data.

Given past TPE errors from previous tide zones, we would expect to see total value of 0.09 for measured and zoning. The estimated TPE values in table 3 below were applied to Survey F00574:

Project	Vessel	Total Tide Values	Sound Velocity Values		
		Measured & Zone	CTD	MVP	Surface
F00574	S222/3101/3102	0.09	4	1	0.2

Table 3: TPE Parameters

These values were calculated for all MBES data immediately following CARIS Merge. *Concur, TPE values verified in CARIS HDCS line log file.*

B 4.2 BASE Surfaces and Mosaics

The following table describes all BASE Surfaces submitted as part of Survey F00574:

<i>Name of Surface</i>	<i>Resolution</i>	<i>Type</i>	<i>Purpose</i>
F00574_Cube_NOAA_1m_Final	1.0 meter	CUBE	Sounding Coverage
F00574_Pier_Cube_NOAA_20cm_Final	0.2 meter	CUBE	Sounding Coverage

Table 4: BASE Surfaces

This survey was processed using HIPS/SIPS 7.0, which uses the csar format for all grids using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. The CUBE configuration was set to NOAA_1m for the one meter coverage surface and NOAA_.5m for the 20cm coverage surface. Refer to the 2009 Data Acquisition and Processing Report*, 2009 Field Procedures Manual, and CARIS HIPS and SIPS User Guide for further discussion. *Concur. *Submitted with H-Cell deliverable.*

B 4.3 Data Cleaning

The survey data was cleaned using swath and subset editor tools in CARIS. All areas of the BASE surface that indicated a high standard deviation were examined and cleaned as required such that no residual errors exist in the surface that exceed the IHO order 1 depth accuracy requirements.

C. HORIZONTAL AND VERTICAL CONTROL

As per FPM section 5.2.3.2.3 a HVCR report was not filed as no horizontal and vertical control stations were established by the field party for this survey. A summary of horizontal and vertical control for this survey follows. *Concur.*

C 1.1 Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at Brunswick, ME (316 kHz), and Acushnet, MA (kHz 306), were used during this survey.

No horizontal control stations were established by the field party for this survey.

C 1.2 Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at Fort Point, NH 842-3898 will serve as datum control for F00574. A request for delivery of final approved (verified) tides for this survey was forwarded to N/OPS1 on 6 October 2009 in accordance with the FPM and project letter instructions*. Verified tides with final zoning were applied to all sounding data on October 21, 2009. *Concur. *Submitted with original field records.*

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

D 1.1 Chart 13214 Comparison

Sounding data were compared to chart 13283, 20th Edition, Oct/07 and corrected to USCG LNM through Oct. 27/07 and NTM Oct. 27/07. Chart 12335 is compiled from surveys taken between a1900 and 1939, with only partial bottom coverage. Significant changes were noted in the common areas, particularly in areas with no soundings. *Concur.*

D 1.2 ENC US5NY1DM Comparison

Soundings are generally comparable with charted depths, except as noted above, with differences in charted and survey soundings 0.2 meter or less. *Concur.*

D.2 Additional Results

D.2.1 Automated Wreck and Obstruction Information Service (AWOIS) Items

No AWOIS items were located within the limits of F00574. *Concur.*

D.2.4 Shoreline

There is no shoreline within the primary sheet limits of survey F00574. The Pier Survey area indicates significant changes to charted pier location and length, and further comparison to current imagery is recommended. *Concur.*

D.2.5 Charted Features

There are 2 uncharted features within the limits of survey F00574, see appendix II* *Concur*
**Appended to this report.*

D.2.6 Charted Pipelines and Cables

There are no charted pipelines or cables within the limits of survey F00574 *Concur*

D.2.7 Bridges, Ferry Routes, and Overhead Cables

There are no ferry routes, bridges, or overhead cable crossings within the limits of the survey.
Concur

D.3 Dangers to Navigation and Shoals

D 3.1 Dangers to Navigation

Two Dangers to navigation were reported to NOAA's Office of Coast Survey on 6 Nov 2009, see appendix I**The Danger to Navigation located at 43-06-24.4N, 70-36-01.2W as a 36 ft rock is recommended to be charted as a sounding within a rocky seabed area instead of a rock.*
**Appended to this report.*

D 3.2 Shoals

There is a rocky outcropping which is not indicated on current charts. See DtoNs above. *Concur*

D.4 Aids to Navigation

There are no charted Aids to Navigation (ATON) within the limits of F00574. *Concur*

D.5 Coast Pilot Information

The Hydrographer has no recommendations for changes or addenda to the Coast Pilot.

D.6 Miscellaneous

Bottom Samples

Bottom samples were not collected. *Concur with clarification. The survey was not compliant with the project instructions. Retain all seabed areas as charted.*

Environmental Conditions and Notes

No significant environmental conditions were noted.

D.8 Adequacy of Survey

This survey is considered complete and adequate to supersede charted depths and features within the common area except as noted in this report. *Concur*

Summary and Recommendations for Additional Work

No additional work is needed to complete this survey. Significant changes to areas with limited sounding information have been noted, although it is recommended that this survey receive normal processing priority.

E. APPROVAL

As Lead Hydrographer, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Office of Coast Survey Hydrographic Surveys Division's *Field Procedures Manual*, and NOS *Hydrographic Surveys Specifications and Deliverables*. Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to N/CS33, Atlantic Hydrographic Branch.

The Data Acquisition and Processing Report for S-A936-TJ-09 is submitted separately and contains additional information relevant to this survey.

Approved and Forwarded:


 Jasper Schaer
2009.11.08
18:50:22 -05'00'

LT Jasper D. Schaer, NOAA
Field Operations Officer

 Digitally signed by Shepard
Smith
Date: 2009.11.10 15:28:14 -05'00'

CDR Shepard M. Smith, NOAA
Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

 daniel wright
2009.11.08
18:50:53 -05'00'

Survey Manager:

Daniel B. Wright, NOAA
Chief Hydrographic Survey Technician

Appendix I

Dangers to Navigation

**Two Dangers to Navigation were reported for survey F00574.
Submitted to OCS-NDB on 6 Nov 2009.**

F00574 Danger To Navigation

Registry Number: F00574
State: Maine
Locality: Atlantic
Sub-locality: 3NM SE York Harbor
Project Number: S-A936-TJ-09
Survey Date: 10/01/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13283	20th	10/01/2007	1:20,000 (13283_1)	USCG LNM: 12/09/2008 (07/14/2009) NGA NTM: None (07/25/2009)
13286	30th	03/01/2004	1:80,000 (13286_1)	[L]NTM: ?
13278	26th	06/01/2005	1:80,000 (13278_1)	[L]NTM: ?
13260	40th	05/01/2007	1:378,838 (13260_1)	[L]NTM: ?
13009	33rd	05/01/2007	1:500,000 (13009_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	1623/32_20ft_Rock	Rock	6.18 m	43° 06' 27.7" N	070° 35' 10.9" W	---
1.2	1693/312_Rocky_Area	Rock	11.20 m	43° 06' 24.4" N	070° 36' 01.2" W	---

1 - Danger To Navigation

1.1) 1623/32_20ft_Rock**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 43° 06' 27.7" N, 070° 35' 10.9" W
Least Depth: 6.18 m (= 20.29 ft = 3.381 fm = 3 fm 2.29 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.004 m ; **TVU (TPEv)** ± 0.228 m
Timestamp: 2009-274.14:10:17.927 (10/01/2009)
Survey Line: f00574 / tj_3102_reson7125_mb / 2009-274 / 450_1407
Profile/Beam: 1623/32
Charts Affected: 13283_1, 13278_1, 13286_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

Least depth in survey area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
f00574/tj_3102_reson7125_mb/2009-274/450_1407	1623/32	0.00	000.0	Primary

Hydrographer Recommendations

Chart DtoN at designated location.

Cartographically-Rounded Depth (Affected Charts):

20ft (13283_1, 13278_1, 13286_1)

3 ¼fm (13260_1, 13009_1, 13006_1, 13003_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091005
 SORIND - US,US_graph,F00574
 VALSOU - 6.183 m
 WATLEV - 3:always under water/submerged

Office Notes

Concur with clarification. The Rk is charted as a result of a DtoN report submitted by this survey corrected with preliminary water levels. Final tidal correction yields 20ft Rk. Delete 18ft rock. Add 20 ft rock.

Feature Images

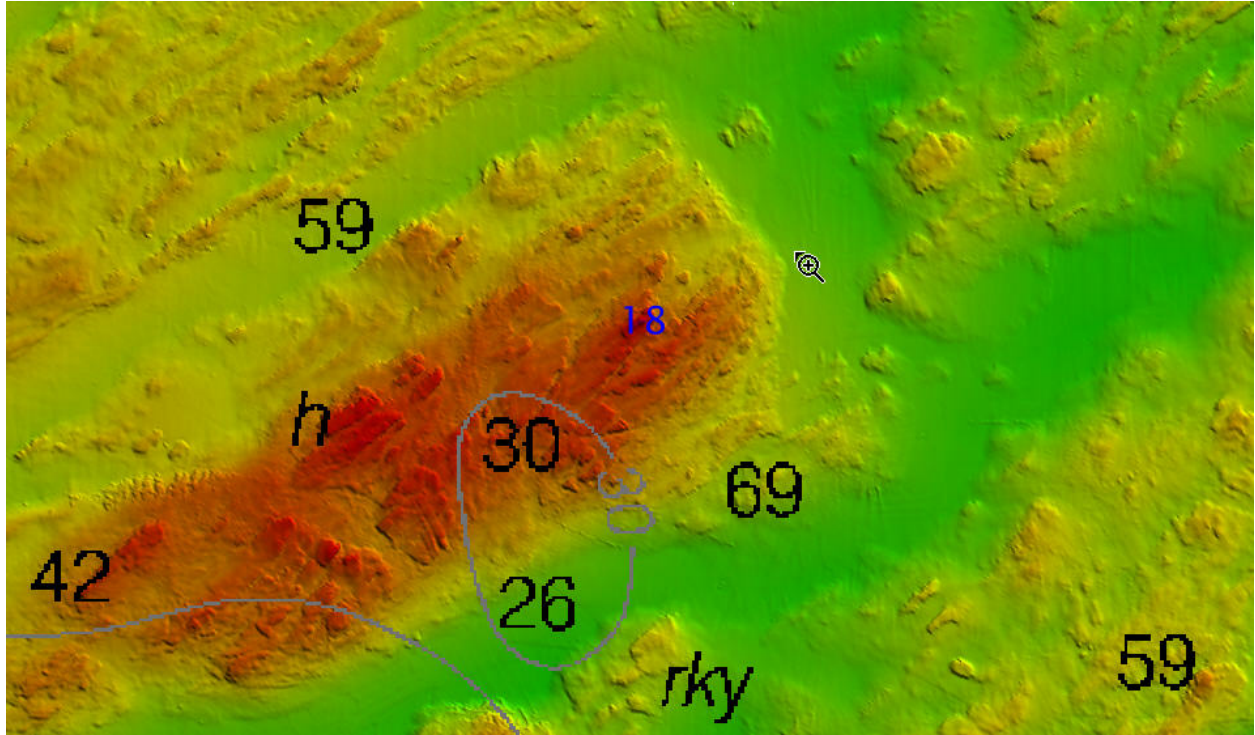


Figure 1.1.1

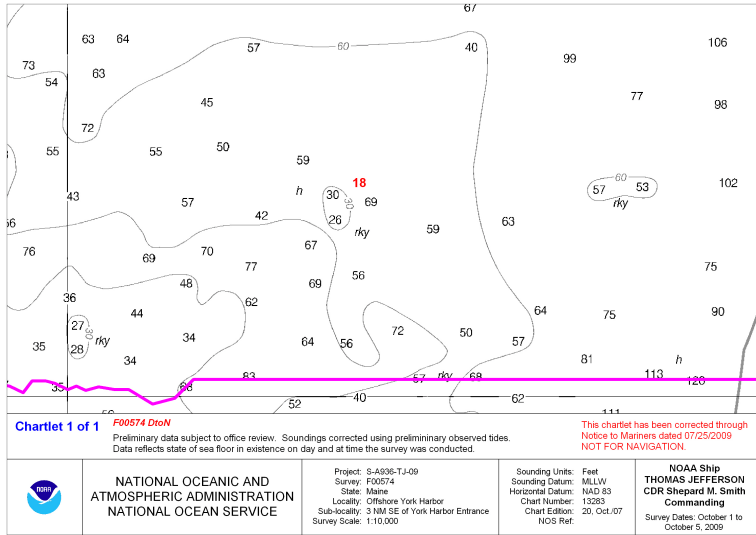


Figure 1.1.2

1.2) 1693/312_Rocky_Area

DANGER TO NAVIGATION

Survey Summary

Survey Position: 43° 06' 24.4" N, 070° 36' 01.2" W
Least Depth: 11.20 m (= 36.75 ft = 6.124 fm = 6 fm 0.75 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.000 m ; **TVU (TPEv)** ± 0.212 m
Timestamp: 2009-274.18:10:03.020 (10/01/2009)
Survey Line: f00574 / tj_3102_reson7125_mb / 2009-274 / 449_1806
Profile/Beam: 1693/312
Charts Affected: 13283_1, 13278_1, 13286_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

Least depth on rocky area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
f00574/tj_3102_reson7125_mb/2009-274/449_1806	1693/312	0.00	000.0	Primary

Hydrographer Recommendations

Chart DtoN at designated location.

Cartographically-Rounded Depth (Affected Charts):

36ft (13283_1, 13278_1, 13286_1)

6fm (13260_1, 13009_1, 13006_1, 13003_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20091005
 SORIND - US,US_graph,F00574
 VALSOU - 11.200 m
 WATLEV - 3:always under water/submerged

Office Notes

Do not concur. Feature is the least depth of a rocky area. Recommend feature be represented as a sounding within a rocky seabed area, included in the H-Cell deliverable. Recommend to delete 35 Rk from the chart.

Feature Images

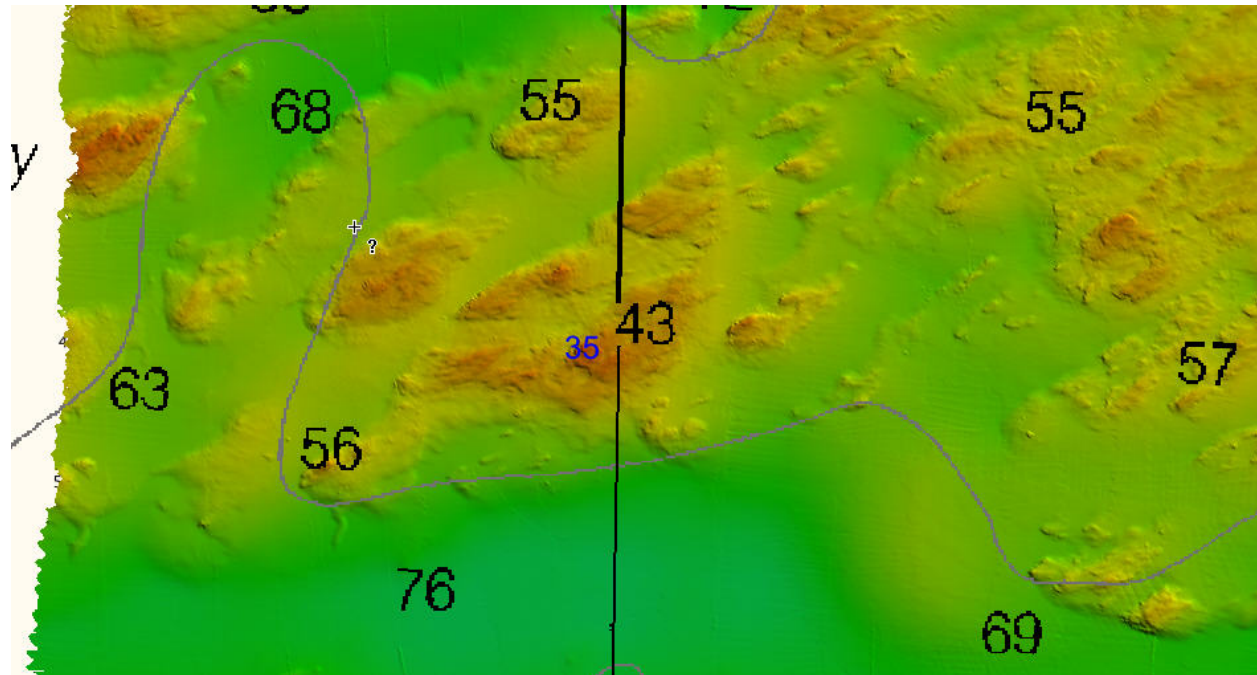


Figure 1.2.1

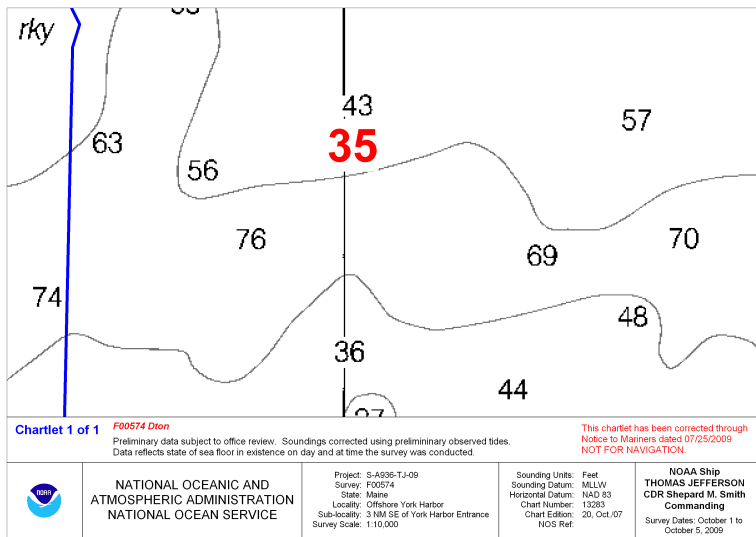


Figure 1.2.2

Appendix II

Survey Features Report

1. AWOIS Items

-none

2. Charted Features

-none

3. Uncharted Features

-2

F00574 Uncharted Feature Report

Registry Number: F00574
State: Maine
Locality: Atlantic
Sub-locality: 3NM SE York Harbor
Project Number: S-A936-TJ-09
Survey Date: 10/05/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13283	20th	10/01/2007	1:10,000 (13283_2)	USCG LNM: 10/06/2009 (03/16/2010) CHS NTM: None (01/29/2010) NGA NTM: None (03/27/2010)
13283	20th	10/01/2007	1:20,000 (13283_1)	USCG LNM: 12/09/2008 (07/14/2009) NGA NTM: None (07/25/2009)
13286	30th	03/01/2004	1:80,000 (13286_1)	[L]NTM: ?
13278	26th	06/01/2005	1:80,000 (13278_1)	[L]NTM: ?
13260	40th	05/01/2007	1:378,838 (13260_1)	[L]NTM: ?
13009	33rd	05/01/2007	1:500,000 (13009_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	430/132 16ft Rk	Rock	4.90 m	43° 04' 20.2" N	070° 42' 40.2" W	---
1.2	534/95 14ft Rk	Rock	4.43 m	43° 04' 19.8" N	070° 42' 41.1" W	---

1 - DR_UnCharted

1.1) 430/132 16ft Rk

Survey Summary

Survey Position: 43° 04' 20.2" N, 070° 42' 40.2" W
Least Depth: 4.90 m (= 16.07 ft = 2.678 fm = 2 fm 4.07 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 0.980 m ; **TVU (TPEv)** ± 0.205 m
Timestamp: 2009-278.18:43:57.548 (10/05/2009)
Survey Line: f00574 / tj_3101_reson8125_mb / 2009-278 / 001_1843
Profile/Beam: 430/132
Charts Affected: 13283_2, 13283_1, 13278_1, 13286_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

Obstruction along pier face

Feature Correlation

Address	Feature	Range	Azimuth	Status
f00574/tj_3101_reson8125_mb/2009-278/001_1843	430/132	0.00	000.0	Primary

Hydrographer Recommendations

Add Obstruction

Cartographically-Rounded Depth (Affected Charts):

16ft (13283_2, 13283_1, 13278_1, 13286_1)

2 ½fm (13260_1, 13009_1, 13006_1, 13003_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 2001005
 SORIND - US,US_graph,F00574
 TECSOU - 3:found by multi-beam
 VALSOU - 4.898 m
 WATLEV - 3:always under water/submerged

Office Notes

Do not concur. Obstruction was identified as a rock in a dive report submitted in Appendix V of the DR. Do not chart rock, recommend to include depth in raster chart legend.

Feature Images

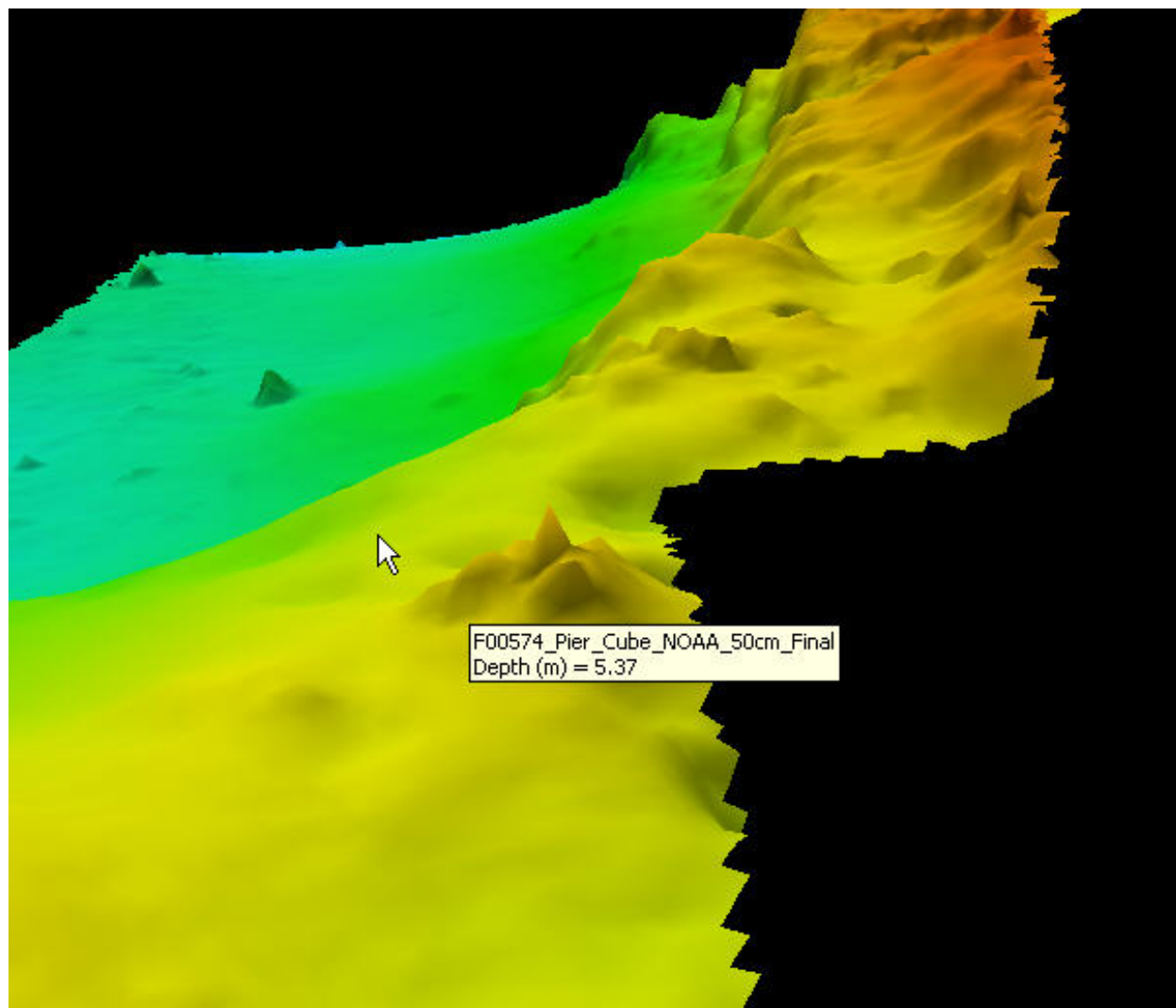


Figure 1.1.1

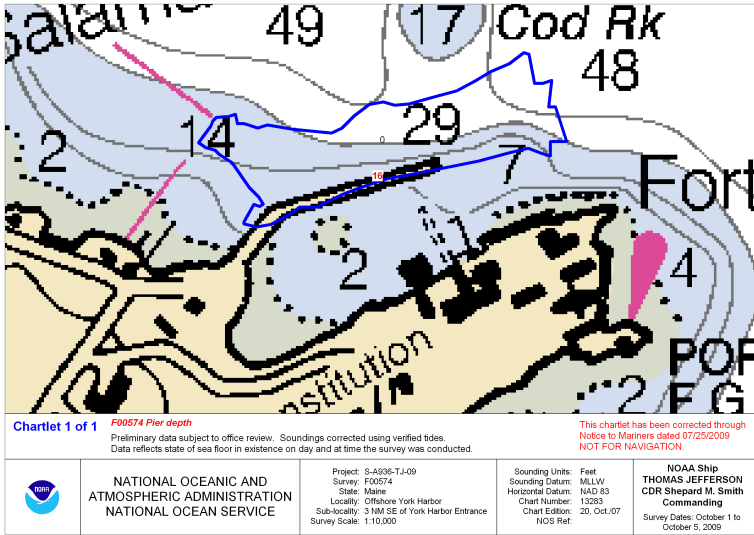


Figure 1.1.2

1.2) 534/95 14ft Rk

Survey Summary

Survey Position: 43° 04' 19.8" N, 070° 42' 41.1" W
Least Depth: 4.43 m (= 14.52 ft = 2.421 fm = 2 fm 2.52 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 0.980 m ; **TVU (TPEv)** ± 0.205 m
Timestamp: 2009-278.18:44:06.698 (10/05/2009)
Survey Line: f00574 / tj_3101_reson8125_mb / 2009-278 / 001_1843
Profile/Beam: 534/95
Charts Affected: 13283_2, 13283_1, 13278_1, 13286_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

Obstruction along pier face

Feature Correlation

Address	Feature	Range	Azimuth	Status
f00574/tj_3101_reson8125_mb/2009-278/001_1843	534/95	0.00	000.0	Primary

Hydrographer Recommendations

Add Obstruction

Cartographically-Rounded Depth (Affected Charts):

14ft (13283_2, 13283_1, 13278_1, 13286_1)

2 ¼fm (13260_1, 13009_1, 13006_1, 13003_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20091005
 SORIND - US,US_graph, F00574
 TECSOU - 3:found by multi-beam
 VALSOU - 4.427 m
 WATLEV - 3:always under water/submerged

Office Notes

Do not concur. Obstruction was identified as a rock in a dive report submitted in Appendix V of the DR. Do not chart rock, recommend to include depth in raster chart legend.

Feature Images

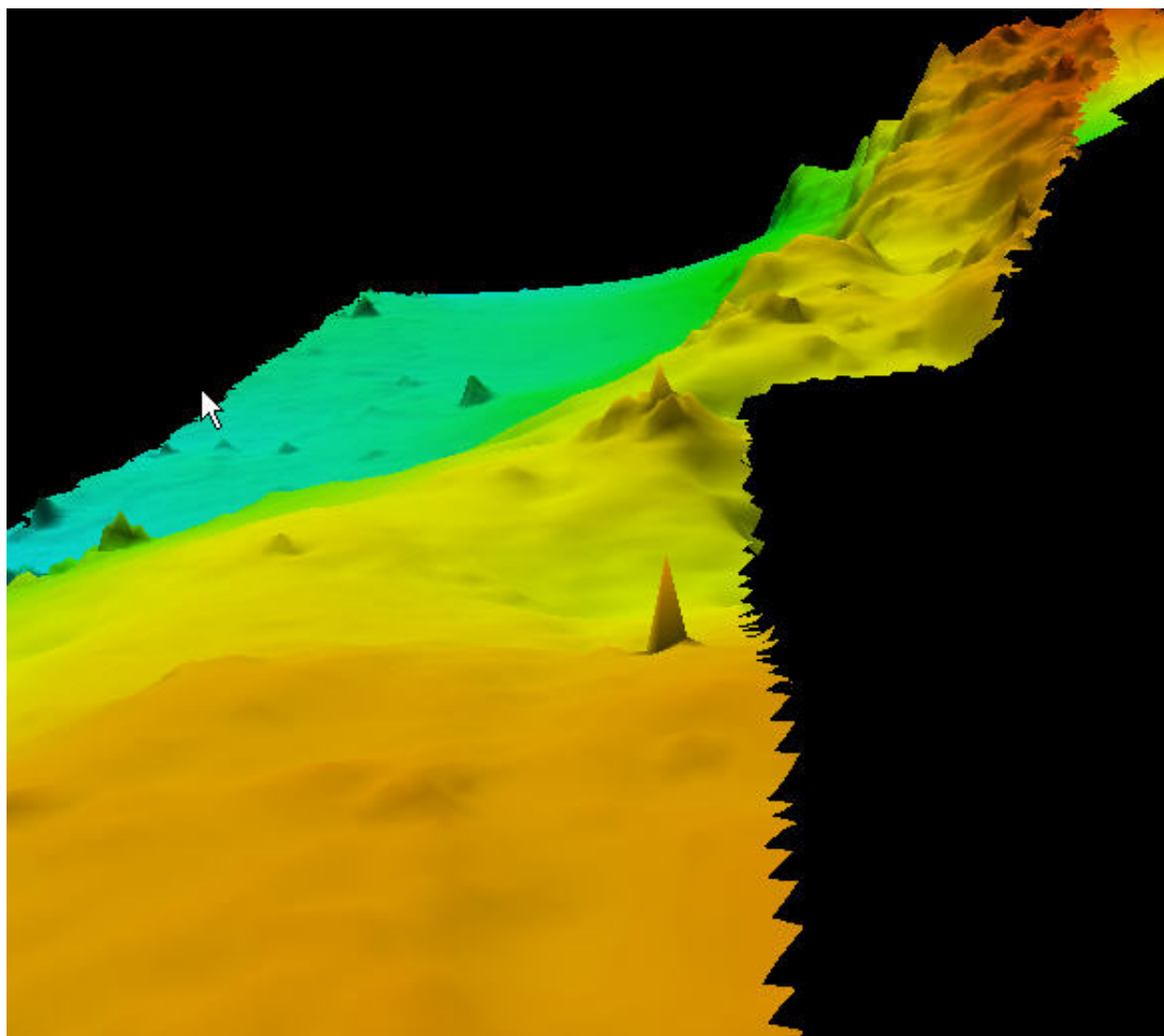


Figure 1.2.1

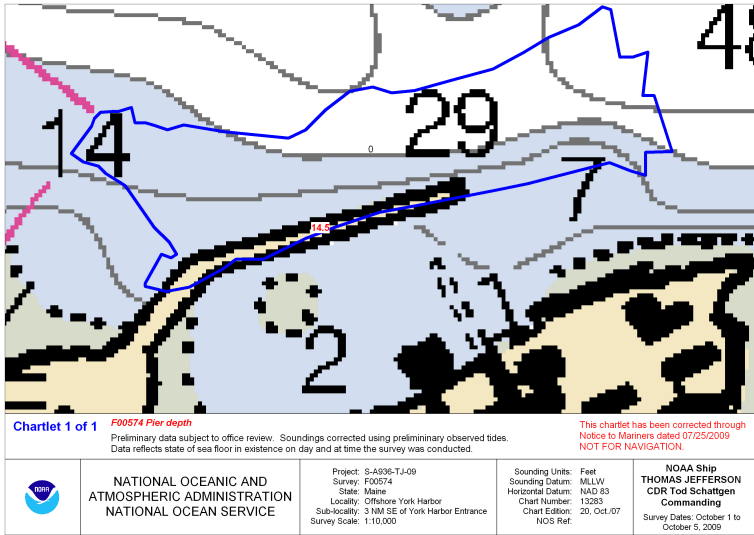
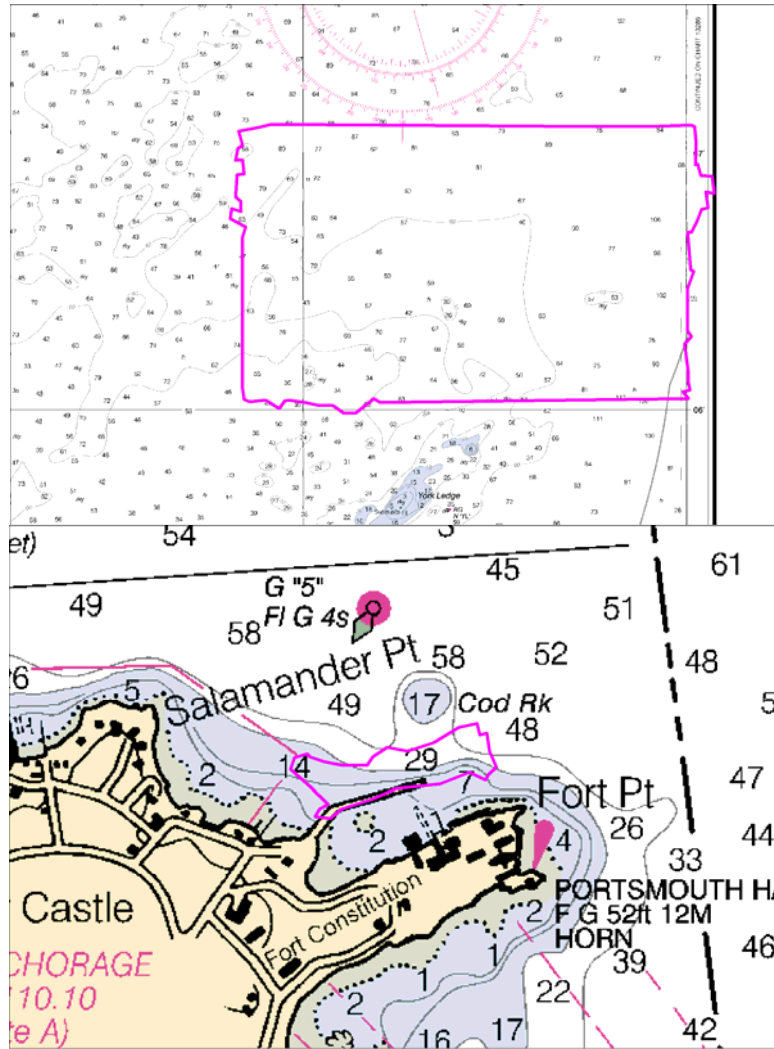


Figure 1.2.2

Appendix III

Progress Sketch



Thomas Jefferson

Survey Progress Estimate

FY2009 Field Season

OPS		FIELD							
Project Number and Name	Sheet Identifier	Registry Number	HQ Estimated SNM	Sheet Start Date	Sheet End Date	Smooth Tides Request Date	Smooth Tides Received Date	Cumulative % Complete at the end of September	Cumulative % Complete at the end of October
S-A936-TJ-09 Apr. to Portsmouth,	1	F00574	1	10/1/09	10/5/09	10/6/09			100%

Appendix IV

Tides and Water Levels

- 1. Tide Notes**
- 2. Request for Approved Tides**
- 3. Final Tide Notes**

WATER LEVEL INSTRUCTIONS
S-A936-TJ-2009 Offshore York Harbor, ME
(9/17/2009 DW)

1.0. TIDES AND WATER LEVELS

1.1. Specifications

Tidal data acquisition, data processing, tidal datum computation and final tidal zoning shall be performed utilizing sound engineering and oceanographic practices as specified in National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables (HSSD), dated April 2008, and OCS Field Procedures Manual (FPM), dated May 2008. Specifically reference Chapter 4 of the HSSD and Sections 1.5.8, 1.5.9, 2.4.3, and 3.4.2 of the FPM.

1.2. Vertical Datums

The tidal datums for this project are referenced to Chart Datum, Mean Lower Low Water (MLLW) and Mean High Water (MHW). Soundings are referenced to MLLW and heights of overhead obstructions (bridges and cables) are referenced to MHW.

The operating National Water Level Observation Network (NWLON) station at Portland, ME (8418150) serves as datum control for the survey area including determination at each subordinate station.

1.2.1. Water Level Data Acquisition Monitoring

The Commanding Officer (or Team Leader) and the Center for Operational Oceanographic Products and Services (CO-OPS) are jointly responsible for ensuring that valid water level data are collected during periods of hydrography. The Commanding Officer (or Team Leader) is required to monitor the pertinent water level data via the CO-OPS Web site at <http://tidesandcurrents.noaa.gov/hydro.shtml>, email data transmissions through TIDEBOT, or through regular communications with CO-OPS/Engineering Division (ED) personnel before and during operations. During traditional non duty hours, the Commanding Officer/Team Leader may contact the Continuous Operational Real-Time Monitoring System (CORMS) watch stander who is available 24 hours/day - 7 days/week for assistance in assessing the status of applicable water level station operation. The CORMS watch stander may be contacted either by phone at 301-713-2540 or by Email: CORMS@noaa.gov. Problems or concerns regarding the acquisition of valid water level data identified by the Commanding Officer/Team Leader shall be communicated with CO-OPS/ED (Tom Landon, 301-713-2897 ext. 191, Email: Thomas.Landon@noaa.gov on the East Coast) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer (or Team Leader) before interrupting the acquisition of water level data for any reason during periods of hydrography.

1.2.2. NWLON Water Level Station Operation and Maintenance

The operating water level station at Fort Point, NH (8423898) will also provide water level reducers for this project. Therefore it is critical that it remains in operation during the survey. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at Fort Point, NH (8423898) by NOAA's THOMASJEFFERSON personnel.

CO-OPS/FOD is responsible for the operation and maintenance of all NWLON primary control stations. If a problem is identified at an NWLON primary control station, FOD shall make all reasonable efforts to repair the malfunctioning station. However, CO-OPS may request assistance from the NOAA ship or NRT personnel in the actual repair of the water level station to facilitate a rapid repair. CO-OPS/FOD and the Commanding Officer (or Team Leader) shall maintain the required communications until the repairs to the water level station have been completed.

1.3. Tide Reducer Stations

1.3.1. No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

Tide Component Error Estimation

The estimated tidal error contribution to the total survey error budget in the vicinity of Offshore York Harbor, ME can not be computed due to a lack of available water level time series data.

1.3.2. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.3.3. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.3.4. This section is not applicable for this project.

1.4. Discrete Tidal Zoning

1.4.1. The water level station at Fort Point, NH (8423898) is the reference station for preliminary tides for hydrography in York Harbor, ME. The time and height correctors listed below for applicable zones should be applied to the preliminary data at Fort Point, NH (8423898) during the acquisition and preliminary processing phases of this project. Preliminary data may be

retrieved in one month increments over the Internet from the CO-OPS Home Page at <http://tidesandcurrents.noaa.gov/olddata> and then clicking on “Preliminary Water Level”. The Commanding Officer (or Team Leader) must notify CO-OPS/ED personnel immediately of any problems concerning the preliminary tides. Preliminary data are six-minute time series data relative to MLLW in metric units on Greenwich Mean Time. For the time corrections, a negative (-) time correction indicates that the time of tide in that zone is earlier than (before) the preliminary tides at the reference station. A positive (+) time correction indicates that the time of tide in that zone is later than (after) the predicted tides at the reference station. For height corrections, the water level heights **relative to MLLW** at the reference station are multiplied by the range ratio to estimate the water level heights relative to MLLW in the applicable zone.

<u>Zone</u>	<u>Time Corrector(mins)</u>	<u>Range Ratio</u>	<u>Predicted Reference Station</u>
NA168	-6	x1.01	8423898

1.4.2. Polygon nodes and water level corrections referencing Fort Point, NH (8423898) are provided in CARIS[®] format denoted by a *.zdf extension file name.

NOTE: The tide corrector values referenced to Fort Point, NH (8423898) are provided in the zoning file “A936TJ2009CORP” for this project and are in the fourth set of correctors designated as TS4. Longitude and latitude coordinates are in decimal degrees. Negative (-) longitude is a MapInfo[®] representation of West longitude

“Preliminary” data for the control water level station, Fort Point, NH (8423898), are available in near real-time and verified data will be available on a weekly basis for the previous week. These water level data may be obtained from the CO-OPS web site at <http://tidesandcurrents.noaa.gov/olddata> . From this site, click on either “Preliminary Water Level” or “Verified Water Level” to obtain preliminary or verified/historical water level data as appropriate.

Please contact the Hydrographic Planning Team at NOS.COOPS.HPT@noaa.gov and the Operational Engineering Team NOS.COOPS.OETTEAM@noaa.gov **before** survey operations begin and **once survey operations are completed** so that the appropriate CO-OPS water level stations are added to or removed from the CO-OPS Hydro Hot List (<http://tidesandcurrents.noaa.gov/hydro>).

1.4.3 Zoning Diagram(s)

Zoning diagrams, created in MapInfo[®] and Adobe PDF, are provided in digital format to assist with the zoning in section 1.4.1.

1.4.4 Final Zoning

Upon completion of project S-A936-TJ-2009, submit a Pydro generated request for smooth tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to smooth.tides@noaa.gov . Provide the project number, as well as a sheet number, in the subject line of the email.

CO-OPS will review the times of hydrography, final tracklines, and six-minute water level data from all applicable water level gauges. After review, CO-OPS will send a notice indicating that the tidal zoning scheme sent with the project instructions has been approved for final zoning. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised tidal zoning scheme to the field group and project manager for final processing.

1.5 TideBot

Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via TideBot application. TideBot delivers timely preliminary/verified tidal and Great Lakes six minute water level observations via email to users on a scheduled, recurring basis. To access TideBot through an email account, send an email to TideBot@noaa.gov with the word “help” as the subject. An email reply will be sent with instructions on how to subscribe to TideBot for time series data retrieval.

1.6 Water Level Records

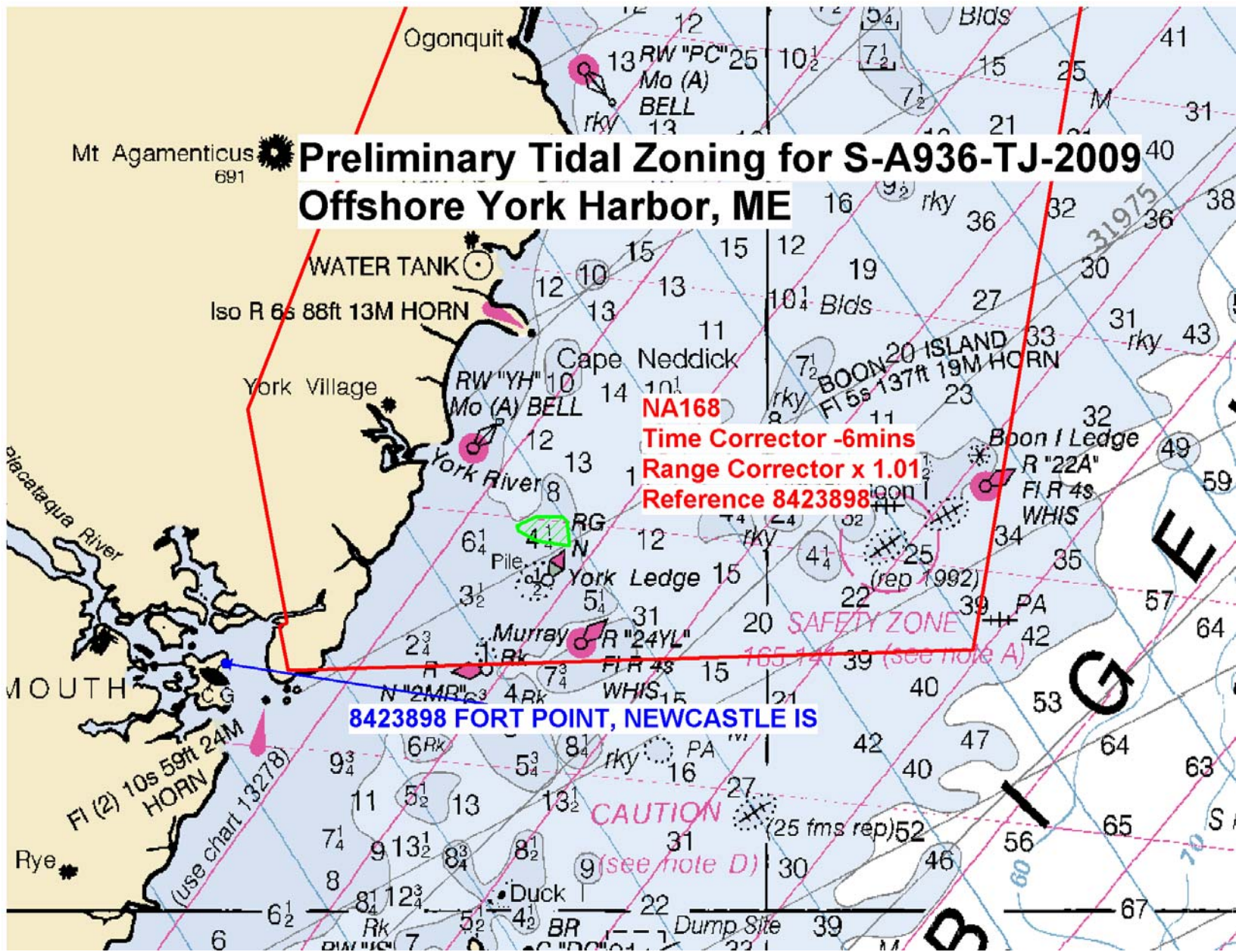
Submit water level data, such as leveling records, field reports, and any other relevant data/reports, including the data downloaded onto diskette/CD within 1 week after the end of each month or the end of hydrography to CO-OPS/ED. Refer to Section 1.1.

1.6.1 Water level records should be forwarded to the following address:

NOAA/National Ocean Service/CO-OPS
Chief, Engineering Division
N/OPS1 - SSMC4, Station 6531
1305 East-West Highway
Silver Spring, MD 20910

Mt Agamenticus
691

Preliminary Tidal Zoning for S-A936-TJ-2009 Offshore York Harbor, ME





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Ship THOMAS JEFFERSON (MOA-TJ)
439 West York St
Norfolk, VA 23510-1145

October 06, 2009

MEMORANDUM FOR: Chief, Requirements and Development Division, N/OPS1

FROM: CDR Shepard Smith, NOAA Ship THOMAS JEFFERSON (MOA-TJ)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final TCARI grid
3. Final zoning in MapInfo and .MIX format
4. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

NOAA/NOS/Atlantic Hydrographic Branch
N/CS33, Building #2
439 West York Street
Norfolk, VA 23510
ATTN: Chief AHB

NOAA Ship Thomas Jefferson
439 West York Street
Norfolk, VA 23510
ATTN: Commanding Officer

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

Project No.: S-A936-TJ-09
Registry No.: F00574
State: Maine
Locality: Atlantic
Sublocality: 3NM SE York Harbor

Attachments containing:

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

cc: N/CS33
MOA/TJ



Year_DOY	Min Time	Max Time
2009_274	12:31:26	20:57:34
2009_278	18:27:58	18:52:49



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 12, 2009

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-A936-TJ-2009
HYDROGRAPHIC SHEET: F00574

LOCALITY: 3NM SE York Harbor, ME
TIME PERIOD: October 1 - October 5, 2009

TIDE STATION USED: 842-3898 Fort Point
Lat. 43° 4.3'N Long. 70° 42.7' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.744 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PIS1, PIS2 , and NA168

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Peter J. Stone
Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/
NOS, email=peter.stone@noaa.gov, c=US
Date: 2009.10.19 07:23:40 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION



Piscataqua River

Final Tidal Zoning for
S-A936-TJ-2009, F00574
SE York Harbor, ME

Mt Agamenticus

CAPE NEDDICK
Iso R 6s 88ft 13M
HORN

Cape Neddick

PORTSMOUTH

PIS2
Time Corrector 0 mins
Range Corrector x 0.99
Reference 8423898

WHALEBACK LT
FI (2) 10s 59ft 24M
HORN
Isles of Shoals

8423898 FORT POINT, NEWCASTLE IS

PIS1
Time Corrector 0 mins
Range Corrector x 1
Reference 8423898

CAUTION

HORN
Kennebunkport

Cape Porpoise

RW "CP"
Mo (A)
WHIS

11 Dump Site
(see note S)

NA168
Time Corrector -6 mins
Range Corrector x 1.01
Reference 8423898

BOON I
FI 5s 137ft 19M HORN

PA
FI R 4s WHIS

R "24YL"
FI R WHIS

Obsn: 16

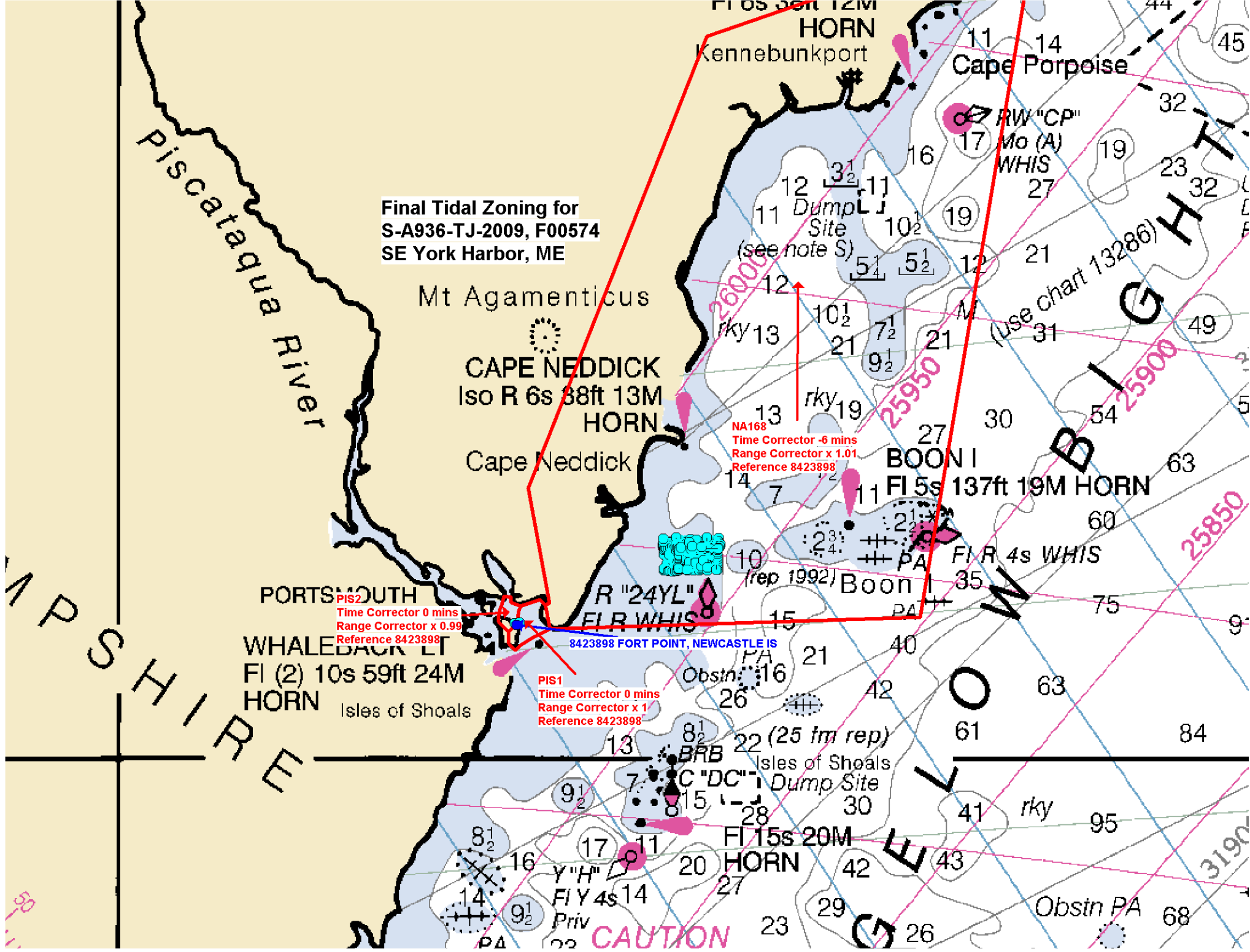
BRB 22 (25 fm rep)
Isles of Shoals
Dump Site

FI 15s 20M
HORN

Y "H"
FI Y 4s 14

Priv

Obsn PA



Appendix V

Supplemental Survey Records & Correspondence

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Tuesday October 6, 2009

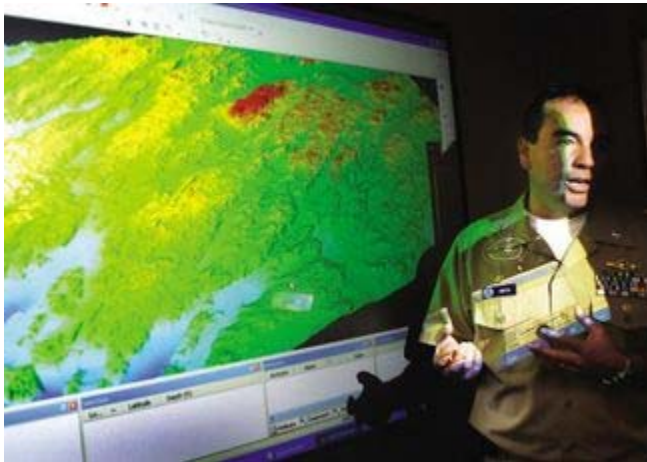
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Technology shows local ocean maps outdated

Photo 1 of 2 | [Zoom Photo +](#)



Cmdr. Shepard Smith, aboard National Oceanic and Atmospheric Administration ship Thomas Jefferson, explains a graphic of the newly mapped ocean floor northeast of the York Ledges. Scientists use state-of-the-art side scan and multibeam systems, he said Monday. The NOAA survey vessel Thomas Jefferson made port at the N.H. State Pier in Portsmouth over the weekend.

Rich Beauchesne/rbeauchesne@seacoastonline.com

By **Deborah Mcdermott**

dmcdermott@seacoastonline.com

October 06, 2009 2:00 AM

PORTSMOUTH — It's been since before World War II that the ocean floor off the coast of Maine has been charted. But now, one part of the coast of York, Maine — near the York Ledges — has been mapped and further mapping is possible once a new National Oceanic and Atmospheric Administration ship makes New Castle home.

The NOAA ship Thomas Jefferson is scheduled to leave today from the N.H. State Pier, where it made a brief stop, after surveying a one-square-nautical-mile test site near the York Ledges. The ship also stopped so the crew could tout the arrival of the NOAA survey ship Ferdinand R. Hassler, which is expected to arrive at its new home at the Coast Guard station in New Castle next year.

It was fitting, as President Jefferson named Ferdinand Hassler the first superintendent of the Coast Survey, the precursor to the ocean mapping NOAA now performs.

Cmdr. Shepard Smith of the Thomas Jefferson said Monday the Hassler will be the fourth NOAA hydrographic survey ship, with equipment to map the ocean floor to provide accurate nautical charts to

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commercial and recreational boats. Two ships are on the West Coast, and until the Hassler arrives, the Jefferson, homeported in Norfolk, Va., is the only ship to cover the entire East Coast.

It's anticipated the Hassler will cover the coast from Long Island Sound north, while the Jefferson will handle the southern coastal waters of the eastern United States.

It's no mistake that the Hassler will be homeported in New Castle, Smith said. NOAA has a close working relationship with the University of New Hampshire Center for Coastal and Ocean Mapping, "and by having a ship here, we can provide a platform for research and development, as well as provide our ongoing relationships with the students."

As a matter of fact, it was while Smith was getting his master's degree in ocean mapping at UNH that he discovered the swath of ocean floor near the York Ledges that has received scant attention for the last 60 or more years.

The geology of the Maine coast is "fairly stable," said Smith, as opposed to parts of the southern Atlantic coast. Likely for this reason, he said, much of the ocean floor was last mapped between 1900 and 1939 with early 20th century technology.

Still, he said, rocks can move with the tides, especially when the area hasn't been mapped in so long.

Smith wrote his thesis on the area near the York Ledges, which is indicated on nautical maps as just a smattering of depths. Because of his work, which he published, the Jefferson in the past several days has been using its high-tech sounding equipment to chart the area near the ledges. He said probably billions of soundings were taken in that area in order to come up with the detailed map.

While there were few major surprises, one rocky outcrop submerged beneath the water proved to be bigger and situated differently than it appears on the older maps. It's drawn as an area between 41 and 57 feet below the surface, when in fact it's much larger and at one point only 20 feet below the surface.

"I draw 15 feet in this boat," he said. "That would give me nightmares if I was to go over that area."

A three-dimensional computer program allows him to look at that section of the ocean floor in detail, showing depth in gradations of red. He said the information will be sent to NOAA for fact-checking and will appear on nautical maps of the Maine coast the next time they're printed.

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From Shepard Smith <Shep.Smith@noaa.gov>

Sent Tuesday, July 14, 2009 11:43 am

To _NMAO MOA FOO Thomas Jefferson <FOO.Thomas.Jefferson@noaa.gov> , _NMAO MOP FOO Fairweather <FOO.Fairweather@noaa.gov> , Olivia Hauser <Olivia.Hauser@noaa.gov> , Briana Welton <Briana.Welton@noaa.gov> , Mark Blankenship <Mark.Blankenship@noaa.gov> , Lynnette v morgan <Lynnette.V.Morgan@noaa.gov> , Daniel Wright <Daniel.Wright@noaa.gov> , Lawrence T Krepp <Lawrence.T.Krepp@noaa.gov>

Cc Rick Brennan <Richard.T.Brennan@noaa.gov> , _NOS OCS HSD AHB <nos.ahb.allpersonnel@noaa.gov>

Subject Soundings under Piers

Attachments vCard(shep_smith)

1K

FYI. Clear guidance from MCD. It is AHB's preference to edit all data from under major piers before the survey arrives at the branch. If we have any questions about it, we will turn on rejected to see the pier structure. For small marina-style "finger" piers that are supported by standard pilings, the pier structure should be rejected, but the seafloor underneath can be left in the dataset.

I suggest the following field procedure for handling the bathy in the vicinity of major piers:

- 1) Survey as close enough to the pier to ensure that the pier face structure is clearly resolved.
- 2) Note the construction of the pier while you are surveying next to it. Note the type of construction, relationship of the underwater structure to the deck, and the customary fendering system in place, estimating dimensions. Come up with an offset from the underwater structure to the plane defined by the customary fendering system. If no fendering system is clear, use a 1m offset from the outer structure.
- 3) In subset, using the location of the underwater structure as reference, reject all soundings and structure inshore of the offset determined in step 2, above.

Note that there is a separate feature management procedure for handling the pier itself, as necessary. It is possible that the best information is the location of the underwater structure as represented by the rejected multibeam soundings, and there are some easy ways of showing these features for the purpose of digitizing the pier. It is also possible that the pier is adequately charted, covered by a GC or orthophoto, or some other method, and this guidance is not meant to be comprehensive for handling piers for feature purposes.

Please contact AHB (Rick) with any questions or concerns.

Shep

Larry-please forward to the NRTs as you see fit.

----- Original Message -----

Subject:Re: [Fwd: Re: shoreline and grids]

Date:Tue, 14 Jul 2009 08:31:33 -0400

From:John Lowell <John.Lowell@noaa.gov>

To:Jeffrey Ferguson <Jeffrey.Ferguson@noaa.gov>

CC:

'shep.smith@noaa.gov' <Shep.Smith@noaa.gov>, Dave Neander

<Dave.Neander@noaa.gov>, Richard T Brennan <Richard.T.Brennan@noaa.gov>, Lyn Preston <Lyn.Preston@noaa.gov>, Travis Newman <Travis.Newman@noaa.gov>, Joseph Robinson <Joseph.Robinson@noaa.gov>, Robert Heeley <Robert.Heeley@noaa.gov>

References:<FC761593E101EB4DB2F45B9D96994D8E010BC3813F@vmail5.noaa.nems>

As a normal practice, do not include data under piers on deliverables to MCD. If there is some unusual circumstance, seek appropriate guidance, use professional judgment, and clearly explain any deviation from the norm.

My soapbox would be that all SOP's in place (or in development) in the field, the processing branch's and MCD, should be focused on the end use of the data and efficient processes to meet quality standards. If it is faster to remove the data from under the pier, then remove it. If it is more efficient to keep the soundings in the data set, then keep it in. But in no cases should the data be compiled to the products delivered to MCD. This will only slow things down at our end - something MCD can ill afford at this time.

In the case of major marine facilities (large piers),. I do recommend that some effort be spent to understand the end use of the data and products. In the case of a pier, work with the Nav Manager and talk to the Port Authority and pilots. There is considerable flexibility to meet the needs of the end user, while maintaining charting and hydrographic standards.

Pls note, I presume the intent of the survey effort is for nautical charting. If you are collecting data to support habitat mapping under man made structures, pls act accordingly.

So, go forth, do good work, and be quick about it. johnl

Jeffrey Ferguson wrote:

> John

>

> I'd appreciate getting the official MCD position on whether HSD's
> submission to MCD should include sndgs under piers

>

> Thanks

> Jeff

>

> -----

> *From*: Shepard Smith <shep.smith@noaa.gov>

> *To*: joseph.robinson <Joseph.Robinson@noaa.gov>

> *Cc*: Robert Heeley <Robert.Heeley@noaa.gov>; Travis Newman

> <Travis.Newman@noaa.gov>; Jeffrey Ferguson <Jeffrey.Ferguson@noaa.gov>

> *Sent*: Wed Jul 08 15:57:10 2009

> *Subject*: Re: [Fwd: Re: shoreline and grids]

>

> Joe,

>

> I look forward to MCD's thoughts. As you know, our take recently has
> been to eliminate soundings that are not reachable by surface craft

> under piers. PHB seems to be going a different direction. I think
> that clarifying your expectations for SS soundings would be
> informative in this discussion.
>
> Thanks,
>
> Shep
>
> joseph.robinson wrote:
>> Shep,
>> From a raster perspective, soundings under piers are of no particular
>> use. Considering our conversation yesterday on the difficulty of
>> showing pier face soundings, I thought you were pulling my leg with
>> this (until I read down through the email string). If ENC wants them,
>> I'd say let Travis chime in. My main concern is that they could cause
>> confusion if a compiler doesn't realize they are from under the pier,
>> and as a result starts to question the positioning (or even
>> existence) of the pier itself.
>> Joe
>>
>> Shepard Smith wrote:
>>> Joe,
>>>
>>> Would you mind commenting on whether you would like to have SS
>>> soundings under piers.
>>>
>>> Thanks,
>>>
>>> Shep
>>>
>>> ----- Original Message -----
>>> Subject: Re: shoreline and grids
>>> Date: Wed, 08 Jul 2009 09:04:06 -0700
>>> From: cathleen barry <Cathleen.Barry@noaa.gov>
>>> To: Peter Holmberg <Peter.Holmberg@noaa.gov>, Shep.Smith@noaa.gov
>>> CC: chiefst Fairweather <ChiefST.Fairweather@noaa.gov>,
>>> Olivia.Hauser@noaa.gov, FOO Rainier <FOO.Rainier@noaa.gov>, Dave
>>> Neander <Dave.Neander@noaa.gov>, Mark.McMann@noaa.gov,
>>> Robert.Ramsey@noaa.gov, Kathryn.Simmons@noaa.gov,
>>> Stephen.Kuzirian@noaa.gov, Matthew.Jaskoski@noaa.gov,
>>> Eric.M.Moore@noaa.gov, Michael.Davidson@noaa.gov,
>>> FOO.Thomas.Jefferson@noaa.gov, Daniel.Wright@noaa.gov,
>>> Mark.Blankenship@noaa.gov, Brent.Pounds@noaa.gov,
>>> ChiefST.Rainier@noaa.gov, FOO.Fairweather@noaa.gov,
>>> Briana.Welton@noaa.gov, Caryn.Arnold@noaa.gov,
>>> Edward.J.Vandenameele@noaa.gov, Castle.E.Parker@noaa.gov,
>>> Edward.Owens@noaa.gov, co fairweather <CO.Fairweather@noaa.gov>,
>>> LCDR Rick Brennan NOAA <Richard.T.Brennan@noaa.gov>,
>>> "megan.n.palmer" <megan.n.palmer@noaa.gov>, Jeffrey Ferguson
>>> <Jeffrey.Ferguson@noaa.gov>, Gary Nelson <Gary.Nelson@noaa.gov>
>>> References: <9d3be65f67694854.4a489d84@noaa.gov>
>>> <4A4A4ED0.7090501@noaa.gov> <4A4A5B77.9090609@noaa.gov>
>>> <4A4A6776.4040904@noaa.gov> <4A53E980.1070606@noaa.gov>
>>> <4A54B290.30107@noaa.gov>
>>>
>>>
>>>
>>> I just had an interesting conversation about this with Sean. Its a
>>> conversation we had ages ago, but it was good to review, and I did get

```
>>> some additional input. So...
>>>
>>> -- In S-57 it as acceptable to show SOUNDGs under piers, however, it is
>>> MCDs policy to not do so.
>>>
>>> -- Sean would like to see us submitting all the good sounding data in
>>> the SS layer of the HCell, including good SOUNDGs under piers. These
>>> would then be used for drawing contours in the most accurate fashion.
>>>
>>> -- For both Branch and MCD use, it is good to have as much information
>>> as possible to direct the compiler's decision in which soundings to
>>> select for the chart, for instance, where shoaling occurs leading up to
>>> and perhaps under a pier.
>>>
>>> -- Having the additional soundings also helps the MCD chart compilers
>>> when the HCell compiler has made a recommendation to reposition a pier
>>> based wholly or in part on the sounding data.
>>>
>>> Cathleen
>>>
>>> Peter Holmberg wrote:
>>> > Re: Shep's question to me
>>> >
>>> > That is not a simple answer, but I'll do my best to explain via
>>> > email. As you are aware many piers are charted as line objects when
>>> > in reality they are actually area objects. I'm not about to propose
>>> > they be charted as area objects, I realize having them depicted as
>>> > lines on the chart is most appropriate per the scale of the chart.
>>> > However if data is rejected at a certain distance from the face of the
>>> > pier it creates a gap around the pier in the BASE surface. Being that
>>> > the DEPART (extents of coverage for those non HCell people reading
>>> > this) is derived from the extents of the surface it creates a gap in
>>> > coverage around the pier. The questions then becomes to the compiler
>>> > "should I just fudge this coverage up to pier? Do I need to go poking
>>> > around in HIPS subset editor to see if there is really data there that
>>> > has been rejected? How do I know there isn't an obstruction along the
>>> > pier face in this data gap? Did the field really survey up to the
>>> > actual pier face or not?" This same situation applies to larger piers
>>> > on larger scale charts also.
>>> > I don't believe that there is a customer that needs to know what the
>>> > seafloor is like under the pier. If the data is used to compile to a
>>> > pier that is just a line, then its not clipped off during HCell
>>> > compilation, but if it is an area object pier, then yes the data that
>>> > goes under pier is then cut off at the face of pier and those
>>> > soundings deleted from the SS HCell. At least that is what I have
>>> > been doing, I may be told this is wrong.
>>> >
>>> > Bottom line for me is that I would much rather cut off a little
>>> > portion of the DEPART than have a gap in my survey in an area so
>>> > crucial to the mariner (right where they need to tie up).
>>> >
>>> > shep.smith wrote:
>>> >> I think it is worth clarifying that the AHB practice is to use the
>>> >> submarine structure of the pier as represented by the (rejected)
>>> >> multibeam soundings on the sheet pile or face pilings and not on a
>>> >> photogrammetric source, which might indeed have relative positioning
>>> >> errors to the multibeam.
>>> >>
>>> >> Pete, I am interested to know what PHB does with the soundings and
```

>>> >> sections of grids that are under charted piers. Do you include them
>>> >> in the final grids? Do you include soundings from the grid in the SS
>>> >> file? How do you know at that point whether they are under the pier
>>> >> or alongside? If you reject or delete them later, how do you know
>>> >> where to reject? Does anyone know of an actual customer who needs to
>>> >> know the seafloor under a pier? How does the current practice meet
>>> >> that customer's needs?
>>> >>
>>> >> We often find ourselves having to make judgments about the depth
>>> >> alongside a pier, and the best way we have found to make a consistent
>>> >> and accurate determination is by rejecting the depths under the pier
>>> >> (as defined by the plane defined by the customary fendering system).
>>> >> We have had to defend this practice a few times and have gained
>>> >> agreement in principle with several port authorities, including the
>>> >> USN/PACOM. We are currently working with the Navy in Bremerton on a
>>> >> similar problem. We used the same principle recently in Guam, New
>>> >> London, Seattle, Tacoma, Boston, and New York.
>>> >> I don't disagree with Jake's proposal for a different flag for "real"
>>> >> soundings not to include in a grid, but I think our interim practice
>>> >> should be to reject them until such a flag is implemented. An
>>> >> interested party can always get the data back out and look at the
>>> >> rejected soundings.
>>> >> Shep
>>> >>
>>> >> chiefst Fairweather wrote:
>>> >>> This was my current understanding of practices and what Jake
>>> >>> describes is how these issues are handled on /Fairweather/ currently.
>>> >>>
>>> >>> If some change to this guidance is warranted it would be helpful
>>> >>> that both branches/Coast Survey decide and agree on what process the
>>> >>> field would be required to follow. The process should be clear and
>>> >>> if distances are required it would be helpful to have them
>>> >>> associated with some mm at survey scale.
>>> >>>
>>> >>> Lynn
>>> >>>
>>> >>>
>>> >>> Peter Holmberg wrote:
>>> >>>> Speaking for PHB, what Jake has stated makes total sense.
>>> >>>>
>>> >>>> Quite often the position of charted shoreline is not accurate. I
>>> >>>> strongly believe it is a bad practice to delete any seafloor data,
>>> >>>> esp. 3 feet from what may or may not be the position of a pier or
>>> >>>> bulkhead.
>>> >>>> FOO Rainier wrote:
>>> >>>>> Hi Olivia,
>>> >>>>>
>>> >>>>> This is a question that perpetually comes up. I had some
>>> >>>>> discussions with PHB last year when we integrated the tilted MBES
>>> >>>>> because we were getting a lot of data, very high up on
>>> >>>>> anthropogenic features and we wanted guidance.
>>> >>>>>
>>> >>>>> First, it has been a long standing request that Caris allow us a
>>> >>>>> flag that is not included as a critical sounding. Outstanding and
>>> >>>>> examined are both considered 'critical' soundings. In my mind,
>>> >>>>> the right answer is to not reject these features, but flag them as
>>> >>>>> something real and not include them in the base surfaces (an
>>> >>>>> option on surface creation). However, currently doing so makes
>>> >>>>> every sounding 'critical' and makes the critical sounding layer a

>>> >>>> total wreck. This has been a recurring update request for Caris.
>>> >>>>
>>> >>>> OK, now to current practice. I think we all agree that pier faces
>>> >>>> should be rejected and not included in the surface. However, your
>>> >>>> email seems to indicate that seafloor underneath piers should be
>>> >>>> rejected as well - up to 3 ft from the pier? Is that correct?
>>> >>>> That is not what the guidance we received from the PHB
>>> >>>> cartographers who would prefer the seafloor be left alone. This
>>> >>>> makes sense to me as our business in the field should be modeling
>>> >>>> the seafloor to the best of our ability. It seems to me that the
>>> >>>> branch should be making the determination of how to depict the
>>> >>>> seafloor and features on a product.
>>> >>>>
>>> >>>> The rules of engagement that we agreed on last year with PHB were:
>>> >>>>
>>> >>>> - We will not reject the "seafloor" anywhere. Clearly we will
>>> >>>> clean out bad soundings to make the surface represent the
>>> >>>> seafloor, but we will not worry about shoaler than 4m or shoaler
>>> >>>> than 0 m as a criteria. Merely whether the data is modeling the
>>> >>>> seafloor. It sounds like the H cell compiler will be able to
>>> >>>> "cut" out anything beyond MLLW with relative ease.
>>> >>>>
>>> >>>> - For cultural features (pilings, piers, buoy's and buoy chains,
>>> >>>> etc.) that are above MLLW (i.e. negative sounding) AND on the
>>> >>>> field verified .hob layer, we will reject the sounding data. The
>>> >>>> idea here would be that we are reporting these features as
>>> >>>> features in the hob. file and we don't want to pull up the BASE
>>> >>>> surface.
>>> >>>>
>>> >>>> - For cultural features that are below MLLW, we will designate the
>>> >>>> sounding (which the BASE surface will honor) AND include it on the
>>> >>>> field verified .hob file.
>>> >>>>
>>> >>>> - For cultural features that are above MLLW and, for one reason or
>>> >>>> another, are not on the field verified .hob file we will flag the
>>> >>>> least depth as "outstanding," but not include it in the BASE
>>> >>>> surface and reject all the other data. Hopefully, this would not
>>> >>>> occur frequently - e.g. we have left the project area and are
>>> >>>> reviewing the bathymetry and notice that we got a piling with
>>> >>>> negative soundings but no corresponding DP or info from the comp
>>> >>>> source. In this case we would use the "outstanding" sounding as
>>> >>>> a basis for creating a new feature in the field verified .hob, but
>>> >>>> it won't affect the BASE surface.
>>> >>>>
>>> >>>> Does this make sense?
>>> >>>> V/r,
>>> >>>> Jake
>>> >>>>
>>> >>>> Olivia.Hauser@noaa.gov wrote:
>>> >>>>>>
>>> >>>>> Hello NOAA Field units,
>>> >>>>>>
>>> >>>>>> It has come to my attention that several recently received
>>> >>>>>> surveyys have come in with soundings representing an anthropogenic
>>> >>>>>> feature, such as a pier, still included in the bathy surface. If
>>> >>>>>> there are depth soundings on features such as pier pilings, under
>>> >>>>>> a pier, on bridge abutments, etc, please reject them from the
>>> >>>>>> data set. The water depth is not really the depths represented by
>>> >>>>>> these features and it creates false depths on land and on

>>> >>>>> features. When rejecting data from the edge of a pier or other
>>> >>>>> shoreline constuction, please take into account the fendering
>>> >>>>> system as well. According to AHB, 3 feet from the pier
>>> >>>>> face/pilings is a good rule of thumb. This goes for ships and
>>> >>>>> NRTs alike. If you have any questions, comments or concerns,
>>> >>>>> please email me. Thanks.
>>> >>>>>
>>> >>>>> V/R, Olivia
>>> >>>>>
>>> >>>>
>>> >
>>>
>>>

Subject: Re: smooth tides request, S-A936, F00574

From: "co.thomas.jefferson" <co.thomas.jefferson@noaa.gov>

Date: Mon, 05 Oct 2009 09:01:46 -0400

To: smooth.tides@noaa.gov

CC: jasper.schaer <jasper.schaer@noaa.gov>, richard.brennan@noaa.gov, shep.smith@noaa.gov, Jeremy McHugh <Jeremy.McHugh@noaa.gov>, James M Crocker <James.M.Crocker@noaa.gov>

HPT,

Please hold on this request. We are going to add a day of work to this project on the way out. We will send a new request when we are done.

Thanks,

Shep

CDR Shepard Smith, NOAA
Commanding Officer
NOAA Ship Thomas Jefferson
439 West York St
Norfolk, VA 23510
757-647-0187

jasper.schaer wrote:
| See attached. -js

Subject: Re: Crossline comparison

From: Chris van Westendorp <Christiaan.VanWestendorp@noaa.gov>

Date: Thu, 10 Sep 2009 13:00:35 -0400

To: "mark.blankenship" <Mark.Blankenship@noaa.gov>

CC: LCDR Rick Brennan <Richard.T.Brennan@noaa.gov>, Castle Parker <Castle.E.Parker@noaa.gov>, Edward Owens <Edward.Owens@noaa.gov>, LT Jasper Schaer <jasper.schaer@noaa.gov>, CDR Shep Smith <Shep.Smith@noaa.gov>, Daniel Wright <Daniel.Wright@noaa.gov>

Mark,

Per 5.1.4.3 of the HSSD, AHB authorizes TJ to use the Standard Deviation layer to conduct surface difference comparison and analysis on future survey submissions of multibeam data. This meets the crossline comparison requirement laid out in HSSD.

Please let me know if you have any questions or need for further clarification.

R/

LCDR Chris van Westendorp, NOAA

mark.blankenship wrote:

Chris,

You mentioned in the meeting today that AHB was not going to require the multiple CUBE surface comparison, instead allowing us to use a single surface standard deviation layer to do our checks with. Is there any memo coming out for that?

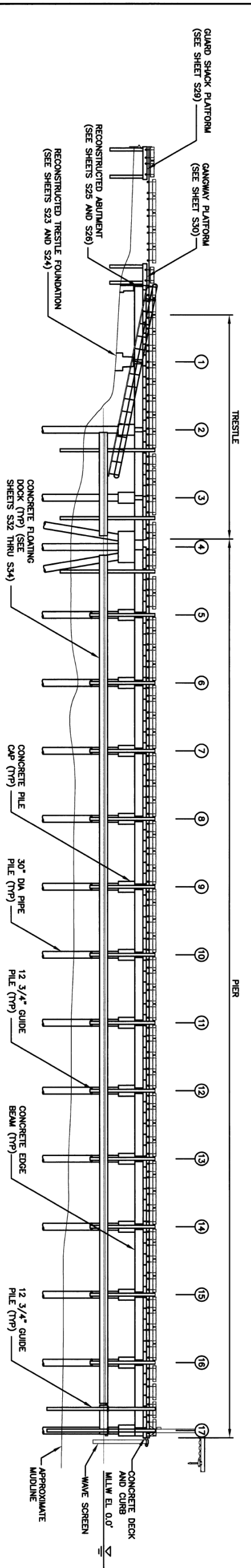
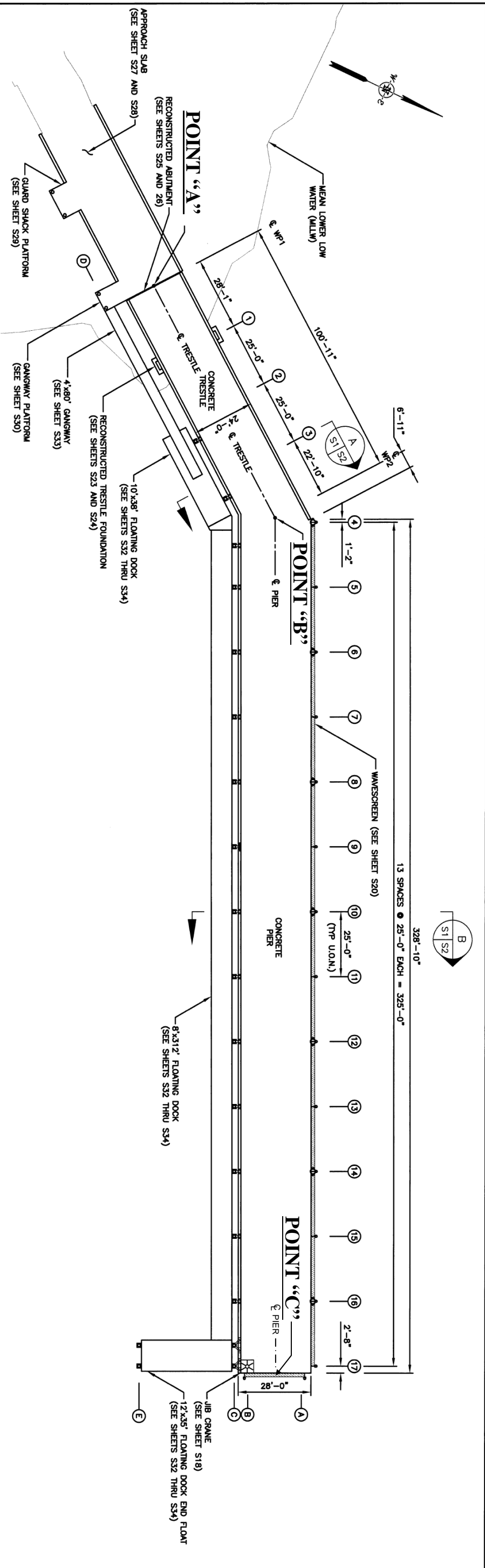
Mark

LCDR Chris van Westendorp <christiaan.vanwestendorp@noaa.gov>

Atlantic Hydrographic Branch

NOAA OCS

PISCATAQUA RIVER FLOOD EBB



AS-BUILT CONTROL

(LATITUDE/LONGITUDE)

PREPARED FOR NOAA ON 10/30/2009

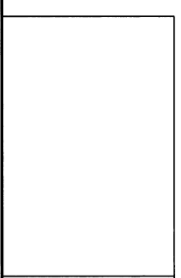
BY R. ROULEAU, UNH PROJECT MANAGER

(LATITUDE/LONGITUDE ESTABLISHED BY GARMIN HANDHELD GPS)

POINT	DESCRIPTION	LATITUDE	LONGITUDE
"A"	C.L. 25'W TRESTLE @ ABUTMENT	N 43° 04.299'	W 70° 42.741'
"B"	C.L. 25'W TRESTLE & 28'W PIER	N 43° 04.313'	W 70° 42.726'
"C"	C.L. 28'W PIER AT END	N 43° 04.337'	W 70° 42.659'

- LEGEND:**
- ① PILE BENT DESIGNATION
 - Ⓐ PILE ROW DESIGNATION

REVISION	DATE	DESCRIPTION	BR



Appliedore Marine Engineering Inc.
 Please International Trademark
 15 Rye Street, Suite 305
 Portsmouth, New Hampshire 03801
 Tel: 603.431.1111
 www.appliedoremarine.com

DATE: NOVEMBER 1, 2006

UNH SOLICITATION #2703-0002
PIER REPLACEMENT
 UNIVERSITY of NEW HAMPSHIRE
 NEW CASTLE, NEW HAMPSHIRE

OVERALL PIER PLAN AND ELEVATION

DRW SCALE: AS SHOWN

SHEET 18 OF 60

S1

AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	F00574
PROJECT No.	S-A936-TJ-09
FIELD UNIT	NOAA SHIP THOMAS JEFFERSON
DATE OF SURVEY	20101005
LARGEST SCALE CHART	13283, edition 20, 20071001, 1:10,000
ADDITIONAL CHARTS	13286, edition 30, 20040301, 1:80,000
SOUNDING UNITS	feet
COMPILER	Kyle S. Bates

Source Grids	File Name
	H:\Compilation\F00574_A936_TJ\AHB_F00574\
	E-SAR Final Products\GRIDS\ F00574_Pier_Cube_NOAA_50cm_Final.csar
	E-SAR Final Products\GRIDS\ F00574_Cube_NOAA_1m_Final.csar
	E-SAR Final Products\GRIDS\F00574_Cube_NOAA_2m_20m_50m.csar
Surfaces	File Name
	H:\Compilation\F00574_A936_TJ\AHB_F00574\COMPILE\Working
<i>Combined</i>	F00574_2m_Combined.csar
<i>Interpolated TIN</i>	\Interpolated TIN\F00574_12m_InterpTIN.csar
<i>Shifted Interpolated TIN</i>	\Interpolated TIN \Shifted Surface\ F00574_12m_InterpTIN_Shifted.csar
Final HOBs	File Name
	H:\Compilation\F00574_A936_TJ\AHB_F00574\COMPILE\Final_Hobs
<i>Survey Scale Soundings</i>	F00574_SS_Soundings.hob
<i>Chart Scale Soundings</i>	F00574_CS_Soundings.hob
<i>Contour Layer</i>	F00574_Contours.hob
<i>Feature Layer</i>	F00574_Features.hob
<i>Meta-Objects Layer</i>	F00574_MetaObjects.hob
<i>Blue Notes</i>	F00574_BlueNotes.hob

Meta-Objects Attribution	
Acronym	Value
M_COVR	
CATCOV	Coverage Available
SORDAT	20091005
SORIND	US,US,graph,F00574
M_QUAL	
CATZOC	zone of confidence U (data not assessed)
INFORM	NOAA Ship Thomas Jefferson
POSACC	10m
SORDAT	20091005
SORIND	US,US,graph,F00574
SUREND	20091005
SURSTA	20091001
DEPARE	
DRVALV 1	2.064m
DRVALV2	36.619m

[Type text]

This Document is for Office Process use only and is intended to supplement, not supersede or replace, information/recommendations in the Descriptive or Evaluation Reports

SORDAT	20091005
SORIND	US,US,graph,F00574
M_CSCL	
CSCALE	10000
SORDAT	20091005
SORIND	US,US,graph,F00574

SPECIFICATIONS:

- I. COMBINED SURFACE:
 - a. Number of ESAR Final Grids: 3
 - b. Resolution of Combined (m): 2m

- II. SURVEY SCALE SOUNDINGS (SS):
 - a. Radius
 - b. Shoal biased
 - c. Use Single-Defined Radius (mm at Map Scale): ; Radius Value = 1 at 10,000
 - d. Queried Depth of All Soundings
 - i. Minimum: 2.064
 - ii. Maximum: 36.619

- III. INTERPOLATED TIN SURFACE:
 - a. Resolution (m): 12m
 - b. Linear
 - c. Shifted value: -0.229m

- IV. CONTOURS:
 - a. Use a Depth List: F00574_NOAA_depth_curves_list.txt
 - b. Line Object: DEPCNT
 - c. Value Attribute: VALDCO

- V. FEATURES:
 - a. Total Number of Features: 1

- VI. CHART SURVEY SOUNDINGS (CS):
 - a. Number of ENC CS Soundings: 87
 - b. Radius
 - c. Shoal biased
 - d. Use Single-Defined Radius: m on the ground
 - i. Or use a Sounding Space Range Table (if applicable): F00574_SSR.txt
 - e. Filter: Interpolated != 1
 - f. Number Survey CS Soundings: 99

**ATLANTIC HYDROGRAPHIC BRANCH
H-CELL REPORT to ACCOMPANY
SURVEY F00574 (2009)**

This H-Cell Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

HSTP PYDRO version 9.10 (r2824)
CARIS HIPS/SIPS version 7.0 SP1 HF 1-5
CARIS Bathy DataBASE version 2.3 HF 1-16
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM version 3.3
CARIS S57 Composer version 2.1 HF 1-4

B.2. QUALITY CONTROL

B.2.1. H-Cell

The AHB source depth grid for the survey's nautical chart update product entailed the field's original 50cm, 1m, and 2m grids, combined at a resolution of 2m. The survey scale selected soundings were extracted from the 2m combined surface. The selected survey scale soundings were extracted from the 2m combined grid using an interval of 1mm at a chart scale of 1:10,000. The chart scale selected soundings are a subset of the survey scale selected soundings. The surface model was referenced when selecting the chart scale soundings to ensure that the selected soundings honor the bathymetry within the common area.

A TIN (Triangulated Irregular Network) surface was created from the survey scale soundings from which an interpolated surface was generated for the purpose of generating depth curves. The curves were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth curves are incorporated into the SS HCell product as per 2009 H-Cell Specifications.

The pre-compilation products or components (Stand Alone HOB files (SAHOB)) are detailed in the Pre-Compile Process Log included in this document. The SAHOB files included depth curves (DEPCNT), depth areas (DEPARE), sounding selections (SOUNDG), features (SBDARE), Meta objects (M_COVR, M_QUAL, M_CSCL), and cartographic Blue Notes. The individual SAHOB files were inserted into one CARIS

BASE Manager feature layer and exported to S57 format in order to create the H-Cell deliverable.

All of the components with the exception of the survey scale sounding selection and depth contours were inserted into one feature layer. The SAHOB H-Cell layer was exported to S-57 format for H-Cell deliverable. F00574 H-Cell chart scale soundings were selected based upon the scale of the applicable chart.

Both S-57 files were converted in CARIS HOM for output of the H-Cell's in chart units (feet). The final deliverables are two S-57 files. The F00574_CS.000 contains the chart scale soundings, features, and meta objects. The F00574_SS.000 contains the survey scale sounding selections and depth contours. Quality assurance checks were made utilizing CARIS S-57 Composer version 2.1 validation checks and dKart Inspector, version 5.0 tests.

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

The F00574 CARIS H-Cell final deliverables include the following products:

F00574_CS.000	1:20,000 Scale	F00574 H-Cell with Chart Scale Selected Soundings
F00574_SS.000	1:10,000 Scale	F00574 Survey Scale Soundings

C. VERTICAL AND HORIZONTAL CONTROL

Final vertical correction processing was completed by the field unit with no additional correction required by Atlantic Hydrographic Branch. The field unit applied verified water levels in conjunction with the final tidal zoning which was approved by N/OPSI CO-OPS. Sounding datum is Mean Lower Low Water (MLLW). Vertical datum is Mean High Water (MHW)

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 19N. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON

13283 (20th Edition, OCT./2007)

Corrected through NM 03/27/2010

Corrected through LNM 01/29/2010

Scale 1:10,000

ENC Comparison

US55NH02M

Portsmouth Harbor, Cape Neddick

Edition 12

Application Date 2010-06-22

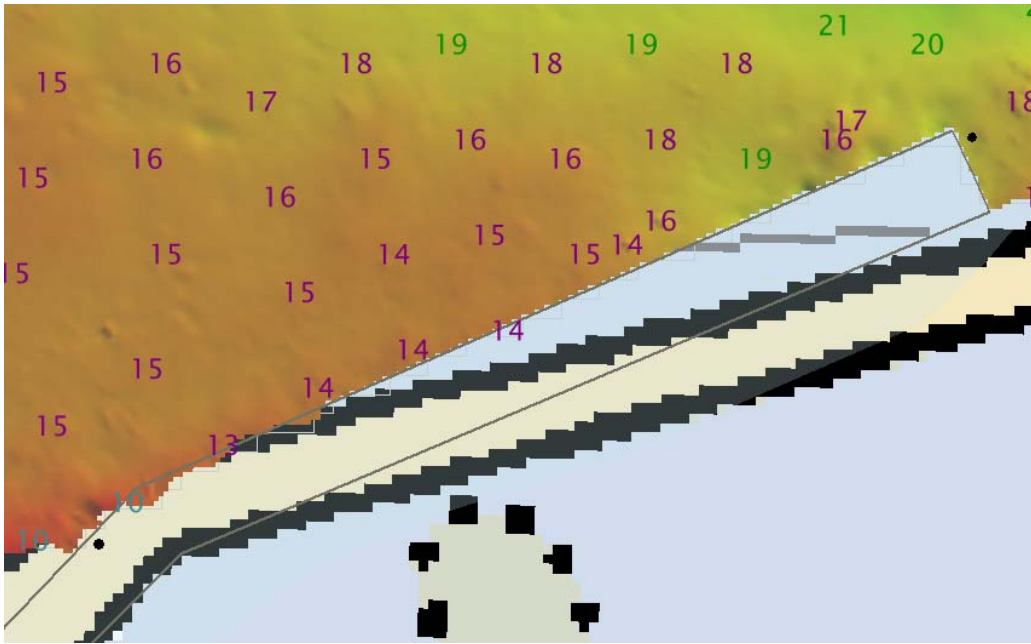
Issue Date 2010-06-22

Chart 13283

D.1.1 Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section “D” and Appendix 1&2 of the Descriptive Report.

- a. The pier located at 43-04-19.1586N, 70-42-42.3342W was digitized to the extent of bathymetry. Three centerline points for this new pier were provided in the attached UNH document, “As-built Control”, located in Appendix V. These points were acquired with a consumer-grade hand-held GPS unit and were of suspect accuracy. As such they were compared to the survey data acquired by NOAA Ship Thomas Jefferson. It was found that there was poor agreement between the centerline points provided by UNH and the Thomas Jefferson data. As such, the dimensions and orientation of the new NOAA/UNH pier were derived from the Thomas Jefferson multibeam sonar data which ensonified all the underwater structure of the pier. When completed, the new digitized pier will be home to the NOAA Ship Ferdinand R. Hassler. The 14 foot depths along the pier are critical for the Hassler, which has a draft of 15 feet. To read more on the Ferdinand Hassler, see the Seacoast Online article, “Technology shows local ocean maps outdated” in Appendix V.



D.3. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey:

D.4. ADEQUACY OF SURVEY

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed in the H-Cell should be retained as charted. Refer to the Descriptive Report for further recommendations by the hydrographer.

APPROVAL SHEET

F00574

Initial Approvals:

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

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

Kyle S. Bates
Hydrographic Intern
Atlantic Hydrographic Branch

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

Approved: _____

Richard T. Brennan
Commander, NOAA
Chief, Atlantic Hydrographic Branch