W00223

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey **Outside Source Data**
Project No. **M-E917-OSD-12**
Registry No. **W00223**

LOCALITY

State **Maryland**

General Locality **SEVERN RIVER**

Sub-locality **WINCHESTER POND TO HORSESHOE POINT**

2011

CHIEF OF PARTY
David G. Bruce, NCBO
HYDROGRAPHER
Jay Lazar, NCBO

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)

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

REGISTRY NUMBER: W00223

HYDROGRAPHIC TITLE SHEET

State: Maryland

General Locality: SEVERN RIVER

Locality: WINCHESTER POND TO HORSESHOE POINT

Scale: 1:10,000 Date of Survey: 11 May 2011 - 12 May 2011

Instructions Dated: N/A Project Number: M-E917-OSD-12

Vessels: R/V Lookdown

Chief of Party: David G. Bruce (Habitat Ecologist, NCBO, NOAA)

Surveyed by: Jay Lazar (Lead Hydrographer, NCBO, NOAA)

Soundings by: Reson 8125 multibeam echosounder

Graphic record scaled by: N/A

Graphic record checked by: N/A

Protracted by: N/A Automated plot by: N/A

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

Soundings in: Feet: _____ Fathoms: _____ Meters: X at MLW: _____ MLLW: X

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. Revisions and Red notes were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

Outside source survey W00223 was submitted without a formal report. The following was included as the body of the Descriptive Report and contains the metadata for this survey.

Remarks: All times are in UTC
UTM Zone 18

NOAA FORM 77-28 SUPERSEDES FORM C & GS - 537

Identification_Information:
  Citation:
    Citation_Information:
      Originator: REQUIRED: NOAA Chesapeake Bay Office Habitat Assessment Team
      Publication_Date: REQUIRED: November 28, 2011.
      Title: Severn River Multibeam Bathymetry of Constructed Reefs with Zoned Tides
      Geospatial_Data_Presentation_Form: remote-sensing image
      Online_Linkage: \\
  Description:
    Abstract: The dataset of multibeam bathymetry over constructed oyster reefs is corrected with zoned tides is a three field ascii file of x-coordinate, y-coordinate, and depth exported from a CARIS Bathymetry Associated with Statistical Error(BASE)surface. The soundings are corrected to the vertical datum of MLLW through a NOAA zone definition file using NOS verified tides created for Chesapeake Bay.
    Purpose: The purpose of multibeam bathymetry is to provide a high resolution dataset of morphology for observing the conditions of the seafloor, specifically constructed oyster reefs as part of an oyster restoration project.
    Supplemental_Information: Data Acquisition -The NCBO survey vessel is integrated with a complete sensor package to conduct multibeam bathymetric and backscatter surveys. The sonar is a Reson Seabat 8125 multibeam designed to map seabeds less than 100 meters deep. The Seabat 8125 is a 455-kHz system with a 120 degree swath consisting of 240 individually formed, electronically roll-stabilized 0.5 degree beams pinging with a maximum rate of 20Hz, depending on water depth. Vessel position and orientation is determined with an Applanix POS/MV Wavemaster V4 (POS). The GPS aided Inertial Motion Unit (IMU) provides measurements of roll, pitch and heading that are all accurate to + 0.03°. Heave measurements supplied by POS maintain an accuracy of 5% of the measured vertical displacement or + 5cm for swell periods of 20 seconds or less. The accuracy and stability of measurements delivered by the system remain unaffected by vessel turns, changes of speed, wave-induced motion (sea state dependent), or other dynamic maneuvers. These corrections are provided real-time to the acquisition software and the raw measurements are recorded via Ethernet logging on the acquisition PC. The IMU is located near the vessel’s center of motion. An auxiliary Trimble DSM 232 differentially corrected global positioning system (DGPS) provides a ground beacon corrected (RTCM) data stream to the POS. The Seabat 8125 is equipped with a real time sound velocity probe (Teledyne Odom Digibar Pro) at the sonar head that is interfaced with the topside unit to correct for sound velocity variability in the water mass and assist accurate beam-forming. The primary sensor for determining sound velocity throughout the water column is a Seabird Electronics SBE-19 Plus V2 CTD. Sound velocity casts are obtained approximately every four hours during survey operations. Hypack Hysweep 2010 provided the acquisition platform for integrating the sensor data in addition to survey setup and navigation. Bathymetry Processing – Bathymetric data were edited with CARIS HIPS processing software. The vessel configuration used for the data conversion was the Lookdown_8125.hvf file. This file includes the preliminary patch test results, the final patch test results, waterline and the Total Propagated Error (TPE) values. Preliminary data processing consisted of: application of sound velocity, preliminary

zoned tides, and CARIS Combined Uncertainty Bathymetric Editor (CUBE) Bathymetry Associated with Statistical Error (BASE)surface creation. The Hips Subset Editor was the second phase of editing. With the CUBE BASE surfaces of depth, standard deviation and hypothesis count identifying areas of outliers, Subset editing was used to remove gross outlier soundings while identifying potential tidal and motion artifacts. The verification and alignment of features from adjacent lines also confirmed preliminary sensor offsets. CUBE BASE surfaces were created to illustrate adequate sonar coverage and to also identify systematic errors or artifacts within the data set. The BASE surfaces created from the merged and TPE calculated soundings are geo-referenced images of a weighted mean surface. The BASE surface uses a combination of range, uncertainty and swath angle weights to assign nodes depth values to create an image of the seabed surface. The BASE surface images were reviewed with multiple resolutions, sun angles, sun azimuths and vertical exaggerations. The BASE surface routine produced images representing depth, shoal-biased depth, deep-biased depth, mean depth,
standard deviation, sounding density, and depth uncertainty. Final subset editing of the entire dataset included post patch test refinement from the application of post-processed kinematic data from the POS system. Zoned verified tide data were applied to correct for variability in water elevation
during the survey and to standardize bathymetry data to the Mean Lower Low Water (MLLW) datum.

Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:May 2010
Calendar_Date:
Currentness_Reference: ground condition

Status:
Progress: Complete
Maintenance_and_Update_Frequency: As needed

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinate: -76.50
East_Bounding_Coordinate: -76.49
North_Bounding_Coordinate: 39.01
South_Bounding_Coordinate: 39.00

Keywords:
Theme:
Theme_Keyword_Thesaurus: REQUIRED: Reference to a formally registered thesaurus
or a similar authoritative source of theme keywords.
Theme_Keyword: Bathymetry
Theme_Keyword: Benthic Habitat

Access_Constraints: None. This data was paid for with public funds.

Use_Constraints: The data is NOT to be used for Navigation. The NOAA Chesapeake Bay
Office makes no warranty, expressed or implied, as to the use or appropriateness
of Spatial Data, and there are no warranties of merchantability or fitness for
a particular purpose or use. The information contained in Spatial Data is from
publicly available sources, but no representation is made as to the accuracy or
completeness of Spatial Data. The NOAA Chesapeake Bay Office shall not be subject to

liability for human error, error due to software conversion, defect, or failure of machines, or any material used in the connection with the machines, including tapes, disks, CD-ROM's or DVD-ROM's and energy. The NOAA Chesapeake Bay Office shall not be liable for any lost profits, consequential damages, or claims against the NOAA Chesapeake Bay Office by third parties. The liability of the NOAA Chesapeake Bay Office for damage regardless of the form of the action shall not exceed any distribution fees that may have been paid in obtaining Spatial Data.

Point_of_Contact:
Contact_Information:
Contact_Person_Primary:
Contact_Person: Jay Lazar
Contact_Organization: NOAA Chesapeake Bay Office
Contact_Position: Hydrographer
Contact_Address:
Address_Type: mailing address
Address: 410 Severn Ave Ste 107
City: Annapolis
State_or_Province: MD
Postal_Code: 21403
Country: US
Contact_Electronic_Mail_Address: jay.lazar@noaa.gov

Data_Set_Credit: Habitat Assessemnt Team - NOAA Chesapeake Bay Office. 410 Seven Avenue, Suite 107A, Annapolis, MD 21403. 410-267-5660

Native_Data_Set_Environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.1.4000

Data_Quality_Information:
Attribute_Accuracy:
Attribute_Accuracy_Report: The accuracy of the reduced depth is a function of the vertical positions from the antenna, the accuracy of the motion sensor, the errors associated with zone definition tide files and the errors associated with the sonar data. This total propogated error calculated in Caris HIPS 7.0 is on average 30 cm for any one sounding. The depths provided are based on the statistical surface which takes many depths into account and therefore lowers the vertical uncertainty.
Quantitative_Attribute_Accuracy_Assessment:
Attribute_Accuracy_Value: 0.25m

Logical_Consistency_Report: The bathymetric data has been corrected for sound velocity errors, draft offsets, navigational offsets, vessel motion and tides. However, all erroneous soundings have not been removed from the dataset. The dataset units are meters.

Positional_Accuracy:
Horizontal_Positional_Accuracy:
Horizontal_Positional_Accuracy_Report: The horizontal positions have been

```
determined
      through Applanix POSPAC MMS v5.3 post processing software and have RMS error
of less than 10cm.
       Quantitative_Horizontal_Positional_Accuracy_Assessment:
         Horizontal_Positional_Accuracy_Value: 0.10m
         Horizontal_Positional_Accuracy_Explanation: Post processing for a
kinematic solution
      allows us to survey on the ellipsoid with differential corrections and
process after the
      survey to reduce horizontal error estimates from greater than 0.5m to less
than 0.1m.
    Vertical_Positional_Accuracy:
       Vertical_Positional_Accuracy_Report: The vertical corrections from
variations in tides
      are made through the application of a zone definition file to verified
tides.
       Quantitative_Vertical_Positional_Accuracy_Assessment:
         Vertical_Positional_Accuracy_Value: 0.25m
         Vertical_Positional_Accuracy_Explanation: Post processing for a kinematic
solution
      allows us to survey on the ellipsoid with differential corrections and
process after
      the survey to reduce vertical position error estimates from greater than
1.0m to less than 0.1m.
  Lineage:
    Source_Information:
      Type_of_Source_Media: Multibeam echosounder
    Process_Step:
      Process_Contact:
        Contact_Information:
          Contact_Person_Primary:
            Contact_Person: Jay Lazar
            Contact_Organization: NOAA-CBO
          Contact_Position: Hydrographer
          Contact_Electronic_Mail_Address: jay.lazar@noaa.gov
Spatial_Data_Organization_Information:
  Direct_Spatial_Reference_Method: x,y,x
  Raster_Object_Information:
    Raster_Object_Type: Pixel
    Row_Count: 0
    Column_Count: 0
    Vertical_Count: 0
Spatial_Reference_Information:
  Horizontal_Coordinate_System_Definition:
    Planar:
      Grid_Coordinate_System:
        Grid_Coordinate_System_Name: Universal Transverse Mercator
        Universal_Transverse_Mercator:
          UTM_Zone_Number: 18
          Transverse_Mercator:
            Scale_Factor_at_Central_Meridian: 0.999600
            Longitude_of_Central_Meridian: -75.000000
            Latitude_of_Projection_Origin: 0.000000
            False_Easting: 500000.000000
            False_Northing: 0.000000
      Planar_Coordinate_Information:
        Planar_Coordinate_Encoding_Method: row and column
        Coordinate_Representation:
```

```
          Abscissa_Resolution: 2.000000
          Ordinate_Resolution: 2.000000
        Planar_Distance_Units: meters
    Geodetic_Model:
      Horizontal_Datum_Name: North American Datum of 1983
      Ellipsoid_Name: Geodetic Reference System 80
      Semi-major_Axis: 6378137.000000
      Denominator_of_Flattening_Ratio: 298.257222
Distribution_Information:
  Resource_Description: Downloadable Data
  Standard_Order_Process:
    Digital_Form:
      Digital_Transfer_Information:
        Transfer_Size: 0.000
Metadata_Reference_Information:
  Metadata_Date: 20110923
  Metadata_Contact:
    Contact_Information:
      Contact_Organization_Primary: NOAA Chesapeake Bay Office Habitat Assessment
Team
        Contact_Organization: REQUIRED: NOAA Chesapeake Bay Office Habitat
Assessment Team
        Contact_Person: REQUIRED: Jay Lazar
      Contact_Address:
        Address_Type: 410 Severn Ave, Ste 107A
        City: Annapolis
        State_or_Province: MD
        Postal_Code: 21403
      Contact_Voice_Telephone: 443-949-9319
  Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata
  Metadata_Standard_Version: FGDC-STD-001-1998
  Metadata_Time_Convention: local time
  Metadata_Extensions:
    Online_Linkage: http://www.esri.com/metadata/esriprof80.html
    Profile_Name: ESRI Metadata Profile
```

APPENDIX I

Tides and Water Levels

No tidal records were submitted with the survey deliverables

APPENDIX II

Supplemental Survey Records and Correspondence

Subject: Fwd: Severn river
From: Abigail Higgins <abigail.higgins@noaa.gov>
Date: 7/19/2012 12:36 PM
To: Edward Owens <edward.owens@noaa.gov>, Jennifer Johnson <jennifer.johnson@noaa.gov>

---------- Forwarded message ----------
From: **Jeffrey Ferguson** <jeffrey.ferguson@noaa.gov>
Date: Thu, Jul 19, 2012 at 12:25 PM
Subject: Fwd: Severn river
To: Todd Haupt <todd.a.haupt@noaa.gov>
Cc: Abigail Higgins <abigail.higgins@noaa.gov>

Todd,

FYI - might be nice to get clarify on the bridge ruins across the river. May be more water available (or less) then people think.

BH2 or a NRT in the area and/or available any time soon?

Thanks,
Jeff

Jeff

****
Jeffrey Ferguson
NOAA, Office of Coast Survey
Chief, Hydrographic Surveys Division
office: 301-713-2700 x124
cell: 240-753-4729

---------- Forwarded message ----------
From: **Abigail Higgins** <abigail.higgins@noaa.gov>
Date: Thu, Jul 19, 2012 at 11:38 AM
Subject: Fwd: Severn river
To: Jeffrey Ferguson <jeffrey.ferguson@noaa.gov>

Hey Jeff-
Below is some correspondence between Ed and John Barber about some submerged ruins found in OSD from the oyster surveys near Annapolis. We can chart soundings and adjust contours based on what we have, which is the current plan, but it is 99% sure that the ruins extend across the extent of the river. We were wondering if the BH2 is in the area, would it be possible for them to survey the submerged ruins? It looks like it would be a quick survey, and would help us make a more informed decision.
Thanks,
Abigail

---------- Forwarded message ----------
From: **Edward Owens** <edward.owens@noaa.gov>
Date: Wed, Jul 18, 2012 at 3:20 PM
Subject: Re: Severn river
To: John Barber <john.barber@noaa.gov>
Cc: Jennifer.johnson@noaa.gov, Abigail Higgins <Abigail.Higgins@noaa.gov>

John,

No worries, I understand. I've attached some images for you to review. If we still want a webex any time on Thursday is fine with me. My take as follows: A very old bridge was sited here (pre-1920 from some documents I've found). Speculatively, at some point in time the deep water portion of the bridge was mostly removed and the bridge converted to a long pier with added piles for mooring at the terminus. The pier finally fell into ruins and was charted as such. However, the bridge ruins were never charted... The question is what to chart, shoal soundings 16,19 over the ruins on the north bank and leave the current ruins as charted ; or extend the ruins as "bridge ruins" all the way across the River :-(In the first instance we have no idea what's between the end of the pier ruins and the extent of the data, something shoaler than 19 may exist... In the second instance, spanning the River with ruins without indication of passage depth I wouldn't take lightly (What are the implications of this?). Lastly, given the age of the ruins, odds are the depths are adequate for the traffic transiting the area, but it seems best to really show what's going on here. Have a look and let me know your thoughts at your convenience.

Phone is - 757-441-6746 ext.203

Thanks, Edward

On 7/17/2012 1:05 PM, John Barber wrote:

Ed,
I got your voice mail. I tried calling you back twice, but keep getting this message, "Your call cannot be completed as dialed, blah blah, blah..."

Anyway, a webex would be great. I don't have the time today, I have a chiefs meeting at 1:30 and am leaving at 2:30. tomorrow is problematic, as I have training from 9:30 to 11:30 and the a CIM meeting from 1pm till I leave again at 2:30. Daddy day care this week. It looks like Thursday is the earliest I can do a webex.

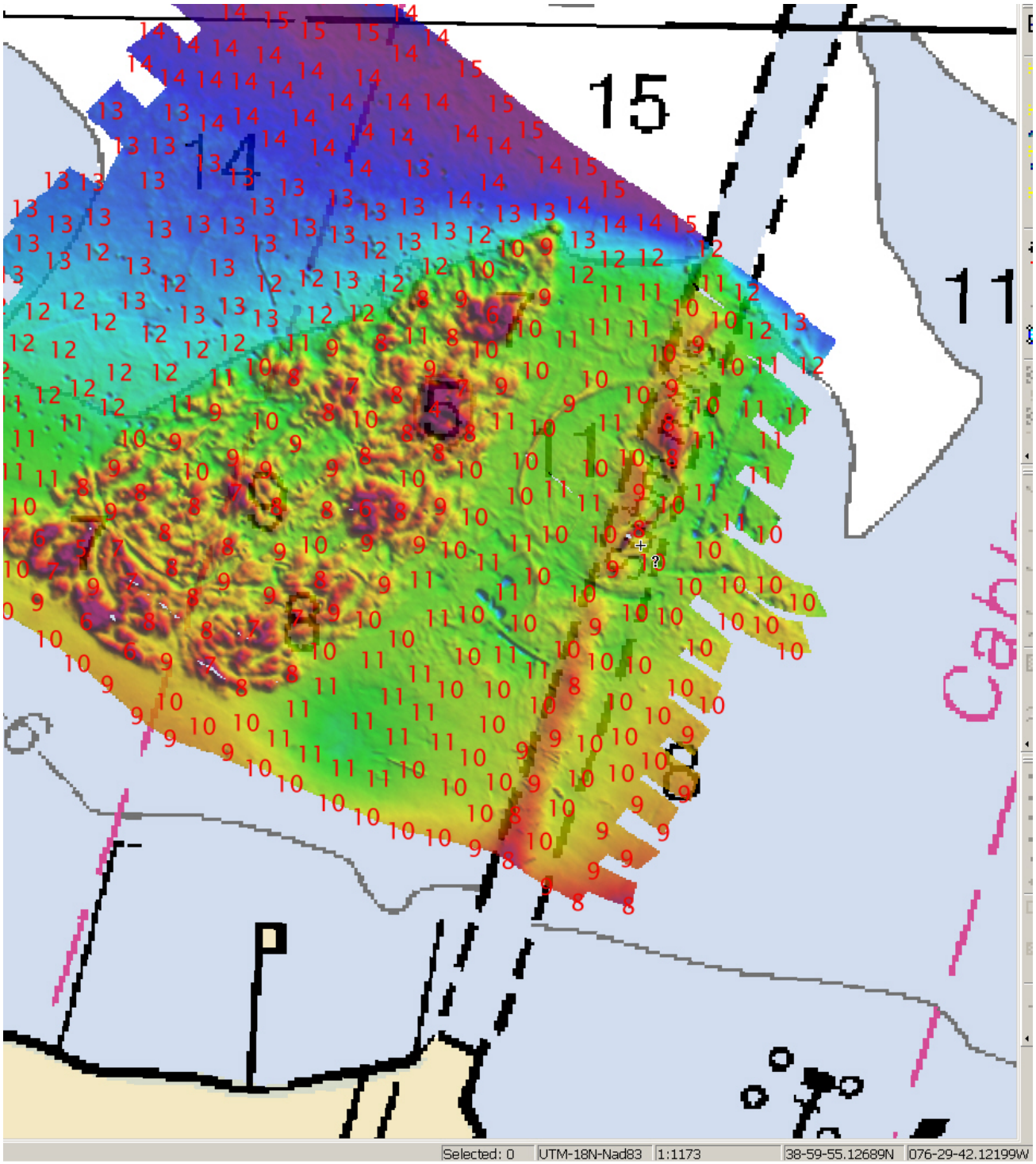
If you can send screen shots in an email or several emails, that would probably be faster, as I can look at those when I am not otherwise engaged.

My apologies for my unavailability.

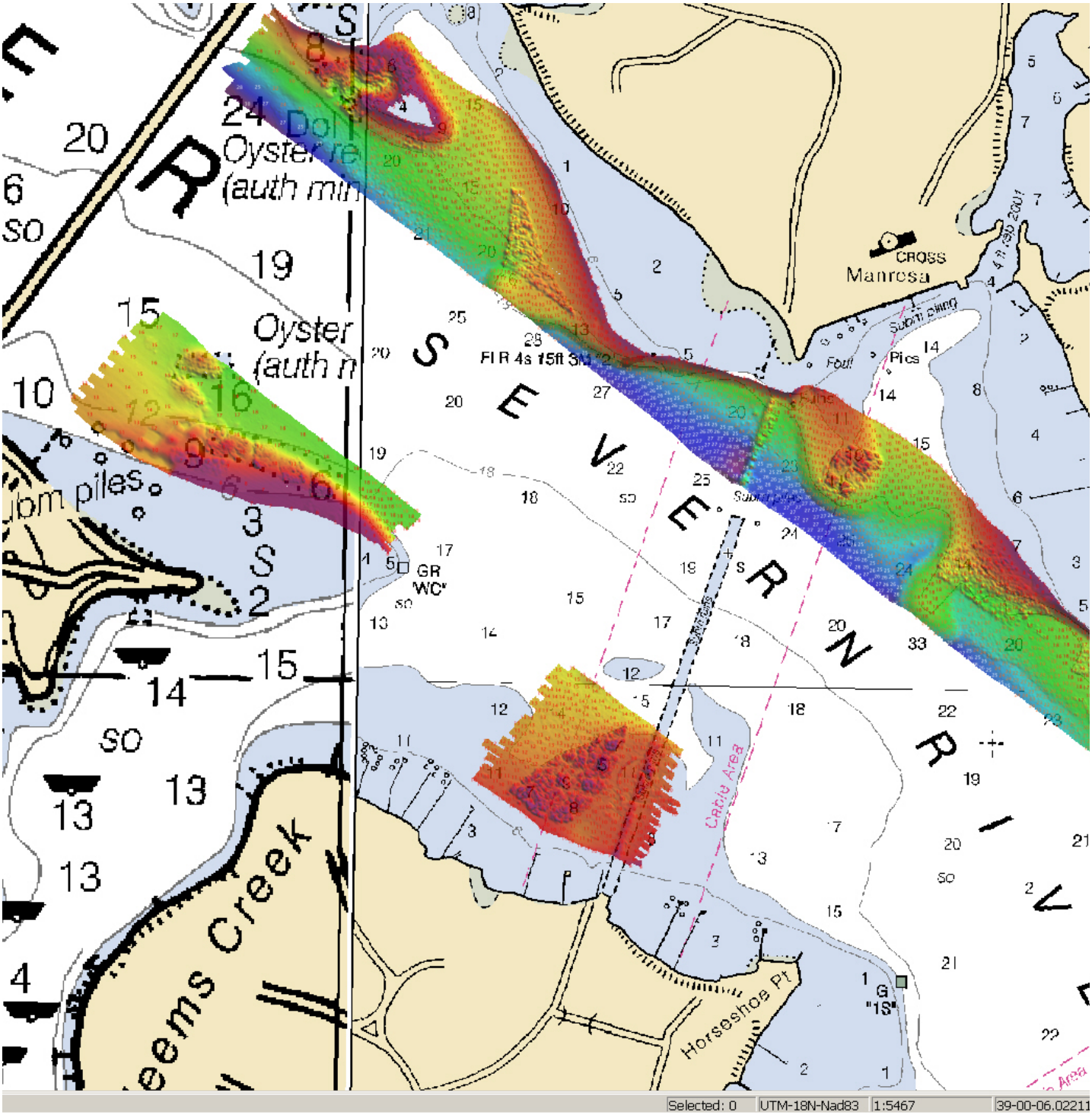
JB

--
John Barber
Chief Products Branch C
NOAA
National Ocean Service
Marine Chart Division
Tel. Work 301-713-2714 Ext. 138

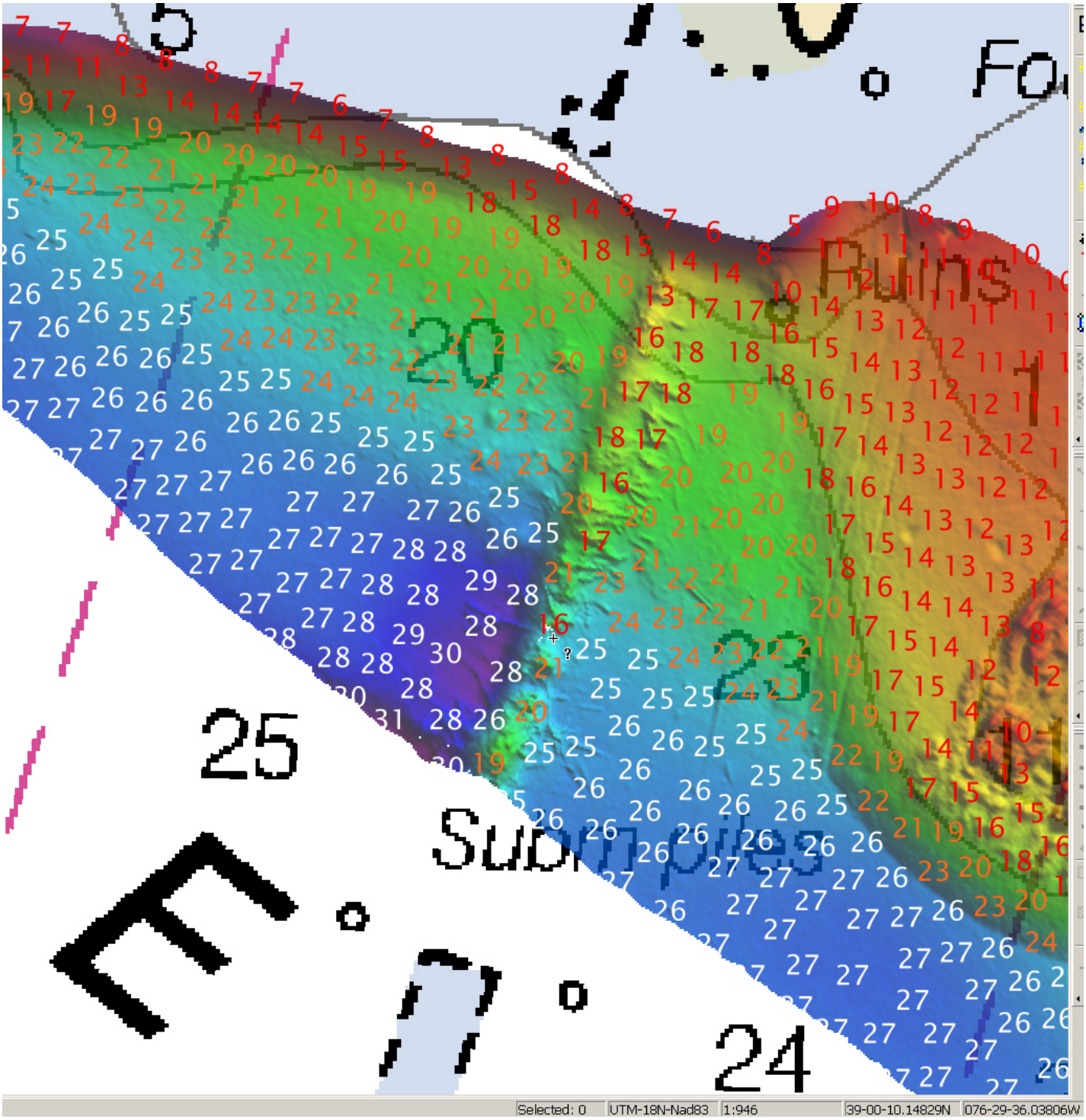
W00223_charted pier ruins_southbank.jpg



W00223_survey area.jpg



W00223_uncharted bridge ruins_northbank.jpg



Edward A. Owens <Edward.Owens@NOAA.GOV>
Lead Physical Scientist
Atlantic Hydrographic Branch
NOAA

Attachments:

W00223_charted pier ruins_southbank.jpg	701 KB
W00223_survey area.jpg	885 KB
W00223_uncharted bridge ruins_northbank.jpg	788 KB

Subject: Re: W00223 DtoN#1
From: John Barber <john.barber@noaa.gov>
Date: 7/19/2012 2:08 PM
To: Katrina Wyllie <katrina.wyllie@noaa.gov>
CC: Edward Owens <Edward.Owens@noaa.gov>

Thanks Katrina, we are processing this straight away today.

JB

On Thu, Jul 19, 2012 at 11:10 AM, Katrina Wyllie <katrina.wyllie@noaa.gov> wrote:

> Hello,
>
> Please find attached a zip file for survey W00223 DtoN report #1, three soundings, for submission to Marine Chart Division (MCD). The contents of the attached WinZip file were generated at Atlantic Hydrographic Branch. The attached zip file contains a DtoN Letter (PDF) and a Pydro XML file.
>
> If you have any questions, please direct them back to me; email me or call 757-441-6746 x205
>
> Thanks,
> Katrina

--
John Barber
Chief Products Branch C
NOAA
National Ocean Service
Marine Chart Division
Tel. Work 301-713-2714 Ext. 138

APPENDIX III

Feature Report

AWOIS: NONE
DtoNs: ONE
MARITIME BOUNDARY: NONE
WRECKS: NONE

Danger to Navigation

Registry Number: W00223
State: Maryland
Locality: Severn River
Sub-locality: Winchester Pond to Horseshoe Point
Project Number: M-E917-OSD-12
Survey Dates: 05/11/2010 - 05/12/2010

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12283	26th	03/01/2006	1:10,000 (12283_1)	[L]NTM: ?
12282	35th	10/01/2005	1:25,000 (12282_1)	[L]NTM: ?
12270	34th	08/01/2006	1:40,000 (12270_1)	[L]NTM: ?
12263	55th	04/01/2007	1:80,000 (12263_1)	[L]NTM: ?
12280	8th	03/01/2008	1:200,000 (12280_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	Shoal Sounding	Shoal	5.99 m	39° 00' 09.2" N	076° 29' 36.7" W	---
1.2	Shoal Sounding	Shoal	5.08 m	39° 00' 10.3" N	076° 29' 36.0" W	---
1.3	Shoal Sounding	Shoal	5.09 m	39° 00' 11.4" N	076° 29' 35.5" W	---

1 - Dangers To Navigation

1.1) Shoal Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	39° 00' 09.2" N, 076° 29' 36.7" W
Least Depth:	5.99 m (= 19.66 ft = 3.276 fm = 3 fm 1.66 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2010-131.16:04:06.000 (05/11/2010)
Dataset:	W00223_DTON_1.000
FOID:	US 0000068445 00001(022600010B5D0001/1)
Charts Affected:	12283_1, 12282_1, 12270_1, 12263_1, 12280_1, 13003_1

Remarks:

SOUNDG/remrks: shoal sounding found with MBES

Feature Correlation

Source	Feature	Range	Azimuth	Status
W00223_DTON_1.000	US 0000068445 00001	0.00	000.0	Primary

Hydrographer Recommendations

chart shoal sounding as DtoN

Cartographically-Rounded Depth (Affected Charts):

19ft (12283_1, 12282_1, 12270_1, 12263_1, 12280_1)

3 ¼fm (13003_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	NINFOM - Add sounding
	SORDAT - 20100512
	SORIND - US,US,graph,W00223
	TECSOU - 3:found by multi-beam

Office Notes

Chart sounding. Data is referenced to MLLW with verified water levels.

Feature Images

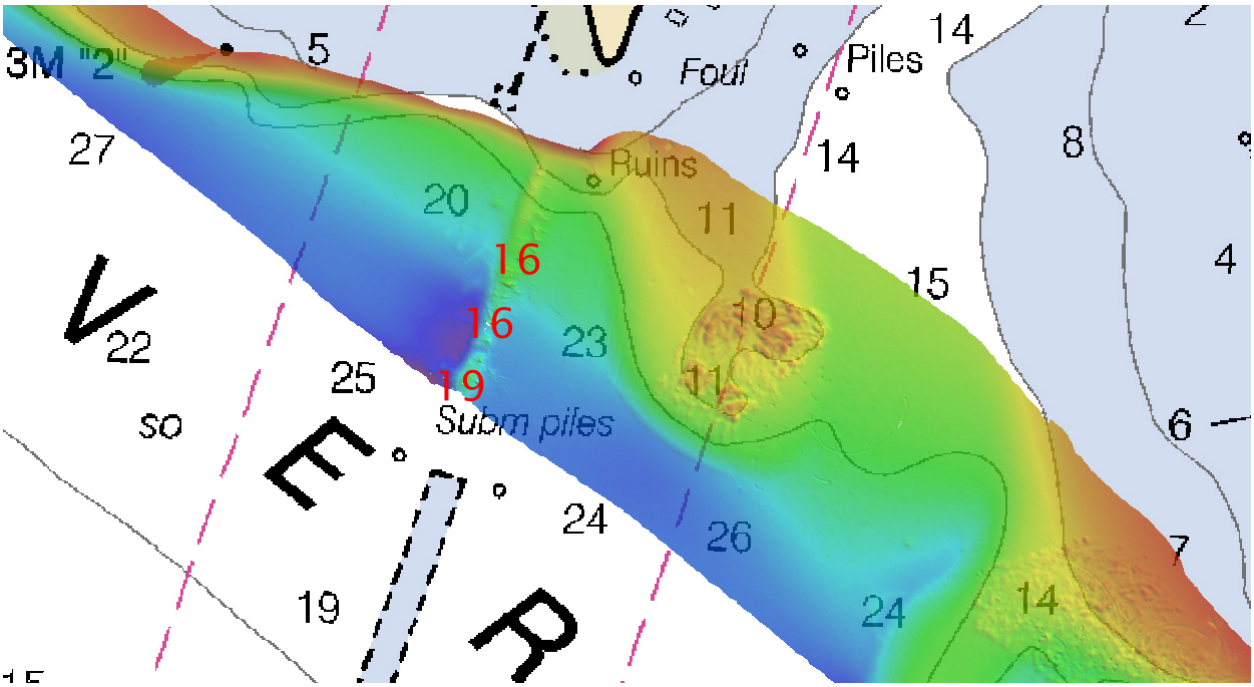


Figure 1.1.1

1.2) Shoal Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	39° 00' 10.3" N, 076° 29' 36.0" W
Least Depth:	5.08 m (= 16.65 ft = 2.776 fm = 2 fm 4.65 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2010-131.17:06:47.000 (05/11/2010)
Dataset:	W00223_DTON_1.000
FOID:	US 0000068446 00001(022600010B5E0001/1)
Charts Affected:	12283_1, 12282_1, 12270_1, 12263_1, 12280_1, 13003_1

Remarks:

SOUNDG/remrks: shoal sounding found with MBES

Feature Correlation

Source	Feature	Range	Azimuth	Status
W00223_DTON_1.000	US 0000068446 00001	0.00	000.0	Primary

Hydrographer Recommendations

chart shoal sounding as DtoN

Cartographically-Rounded Depth (Affected Charts):

16ft (12283_1, 12282_1, 12270_1, 12263_1, 12280_1)

2 ¾fm (13003_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	NINFOM - Add sounding
	SORDAT - 20100512
	SORIND - US,US,graph,W00223
	TECSOU - 3:found by multi-beam

Office Notes

Chart sounding. Data is referenced to MLLW with verified water levels.

Feature Images

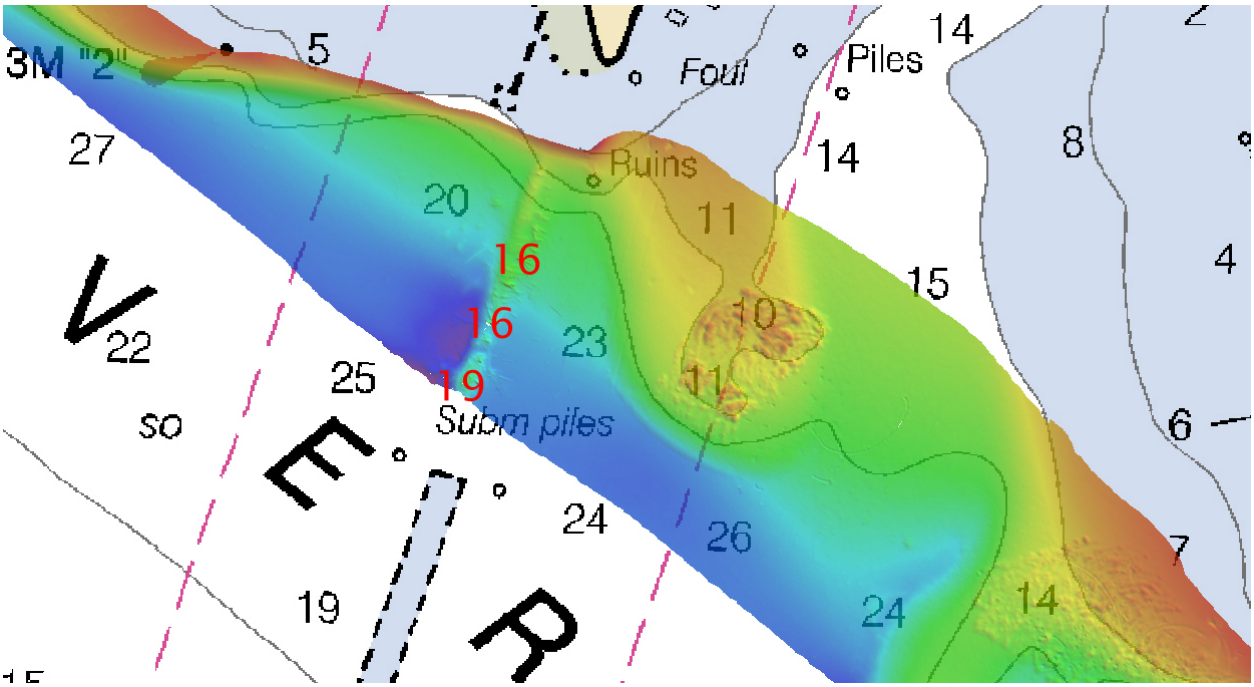


Figure 1.2.1

1.3) Shoal Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	39° 00' 11.4" N, 076° 29' 35.5" W
Least Depth:	5.09 m (= 16.69 ft = 2.782 fm = 2 fm 4.69 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2010-132.14:52:51.000 (05/12/2010)
Dataset:	W00223_DTON_1.000
FOID:	US 0000068447 00001(022600010B5F0001/1)
Charts Affected:	12283_1, 12282_1, 12270_1, 12263_1, 12280_1, 13003_1

Remarks:

SOUNDG/remrks: shoal sounding found with MBES

Feature Correlation

Source	Feature	Range	Azimuth	Status
W00223_DTON_1.000	US 0000068447 00001	0.00	000.0	Primary

Hydrographer Recommendations

chart shoal sounding as DtoN

Cartographically-Rounded Depth (Affected Charts):

16ft (12283_1, 12282_1, 12270_1, 12263_1, 12280_1)

2 ¾fm (13003_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	NINFOM - Add sounding
	SORDAT - 20100512
	SORIND - US,US,graph,W00223
	TECSOU - 3:found by multi-beam

Office Notes

Chart sounding. Data is referenced to MLLW with verified water levels.

Feature Images

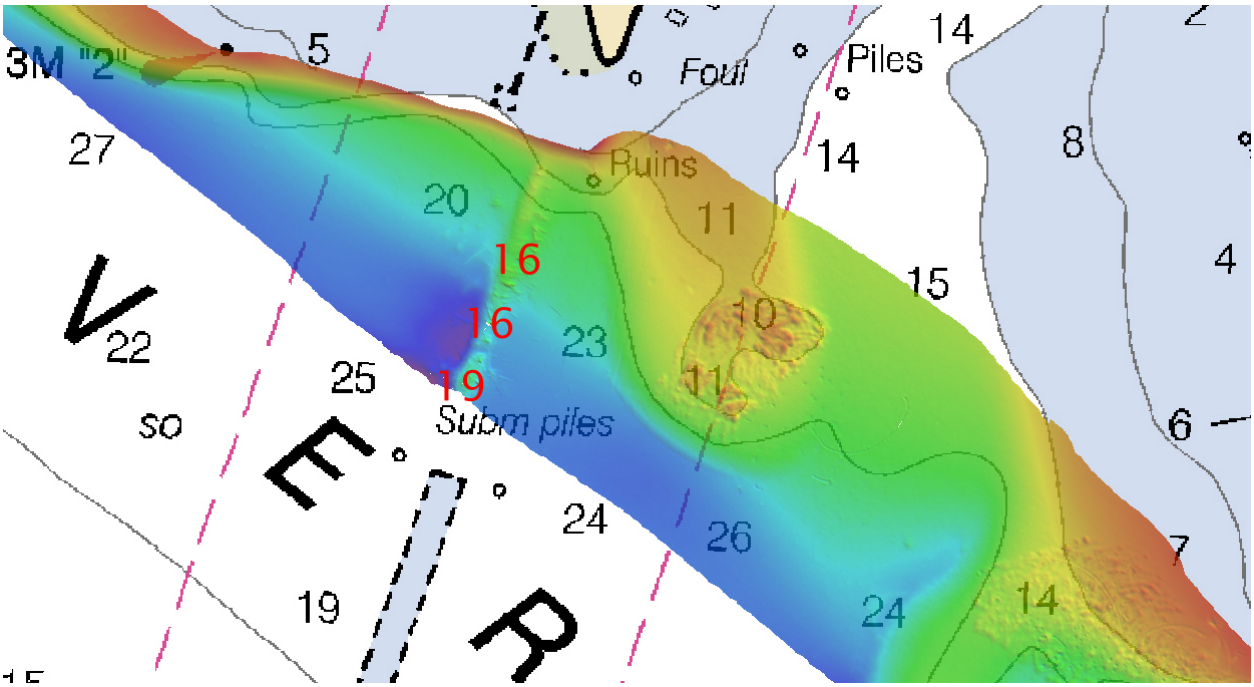


Figure 1.3.1

APPROVAL PAGE

W00223

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

The following products will be sent to NGDC for archive

- W00223DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- W00223_GeoImage.pdf

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

Digitally signed by Edward Owens
DN: cn=Edward Owens, o=NOAA, ou=AHB, email=Edward.Owens@noaa.gov, c=US
Date: 2012.07.31 10:43:42 -04'00'

Approved for: _____

LT Abigail Higgins
Chief, Atlantic Hydrographic Branch