

H12270

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey
Field No. N/A
Registry No. H12270

LOCALITY

State Maine
General Locality Eastport
Sublocality Passamaquoddy Bay

2010

CHIEF OF PARTY

LTJG Matthew Nardi

LIBRARY & ARCHIVES

DATE _____

| | |
|---|---|
| <p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p> | <p>REGISTRY No</p> <p style="text-align: center;">H12270</p> |
| <p>INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p> | <p>FIELD No: N/A</p> |
| <p>State <u> Maine </u></p> <hr/> <p>General Locality <u> Eastport </u></p> <hr/> <p>Sub-Locality <u> Passamaquoddy Bay </u></p> <hr/> <p>Scale <u> 1:10,000 </u> Date of Survey <u> 09/16/2010 to 10/25/2010 </u></p> <hr/> <p>Instructions dated <u> 05/27/2010, revisions 09/21/2010 </u> Project No. <u> OPR-A375-NRT3-10 </u></p> <hr/> <p>Vessel <u> NOAA NRT-5, S3002 </u></p> <hr/> <p>Chief of party <u> LTJG Matthew Nardi </u></p> <hr/> <p>Surveyed by <u> Nick Forfinski, Matt Andring, David McIntire </u></p> <hr/> <p>Soundings by <u> Kongsberg Simrad EM 3002 multibeam echosounder </u></p> <hr/> <p>SAR by <u> Toshi Wozumi </u> Compilation by <u> Kurt Brown </u></p> <hr/> <p>Soundings compiled in <u> Meters </u></p> <hr/> | |
| <p>REMARKS: <u> All times are UTC. UTM Zone 19 </u></p> <hr/> <p><u> 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 end notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non sequential. </u></p> <hr/> <p><u> 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/. </u></p> <hr/> | |

DESCRIPTIVE REPORT

HYDROGRAPHIC SURVEY H12270

OPR-A375-NRT5-10

Scale of Survey: 1:10,000

September - October 2010

NOAA Navigation Response Team 5

Matthew Nardi, Team Lead for Final Processing

Nicholas A. Forfinski, Team Lead for Acquisition

A. AREA SURVEYED

The purpose of project OPR-A375-NRT5-10 was to provide contemporary surveys to update National Ocean Service (NOS) nautical charts in Cobscook Bay and around Eastport, ME. H12270 covered an area of approximately 5.71 nm², from St. Croix River in the north to Pleasant Point in the south.

Complete multibeam echosounder (MBES) coverage was obtained in the survey area to the Navigable Area Limit Line (NALL). Data were acquired as close to shore as safely possible, to the MHW Buffer, or to the 4-meter curve. Additional coverage was obtained in order to determine least depths over features or navigationally significant shoal areas.

Limited shoreline verification was conducted to determine the inshore limit of hydrography and for feature verification of H12270 as per section 3.5.5.3 of the Field Procedures Manual April 2010 (FPM). Shoreline features were given S-57 attribution and included for submission as part of the Pydro Survey Session (PSS).

See Figure 1 on the following page for the survey limits. In accordance with the project instructions, 100% multibeam coverage was acquired for this survey. See Table 1 for a summary of acquisition statistics:

Table 1: Acquisition Summary Statistics

| | |
|--|--|
| Mainscheme single beam sonar only | 0 nm |
| Mainscheme side scan sonar only | 0 nm |
| Mainscheme multibeam sonar only | 178.87 nm |
| Mainscheme single beam sonar/side scan sonar | 0 nm |
| Crosslines (single beam/multibeam) | 0 nm/7.67 nm |
| Developments (single beam/multibeam) | 0 nm/0 nm |
| Shoreline/nearshore investigation | 0 nm |
| # of bottom samples | 0 |
| # of items requiring additional effort | 0 |
| Total square nautical miles | 5.71 |
| Dates of data acquisition | September 16 October 5, 7, 14, 19, 20, 25 |

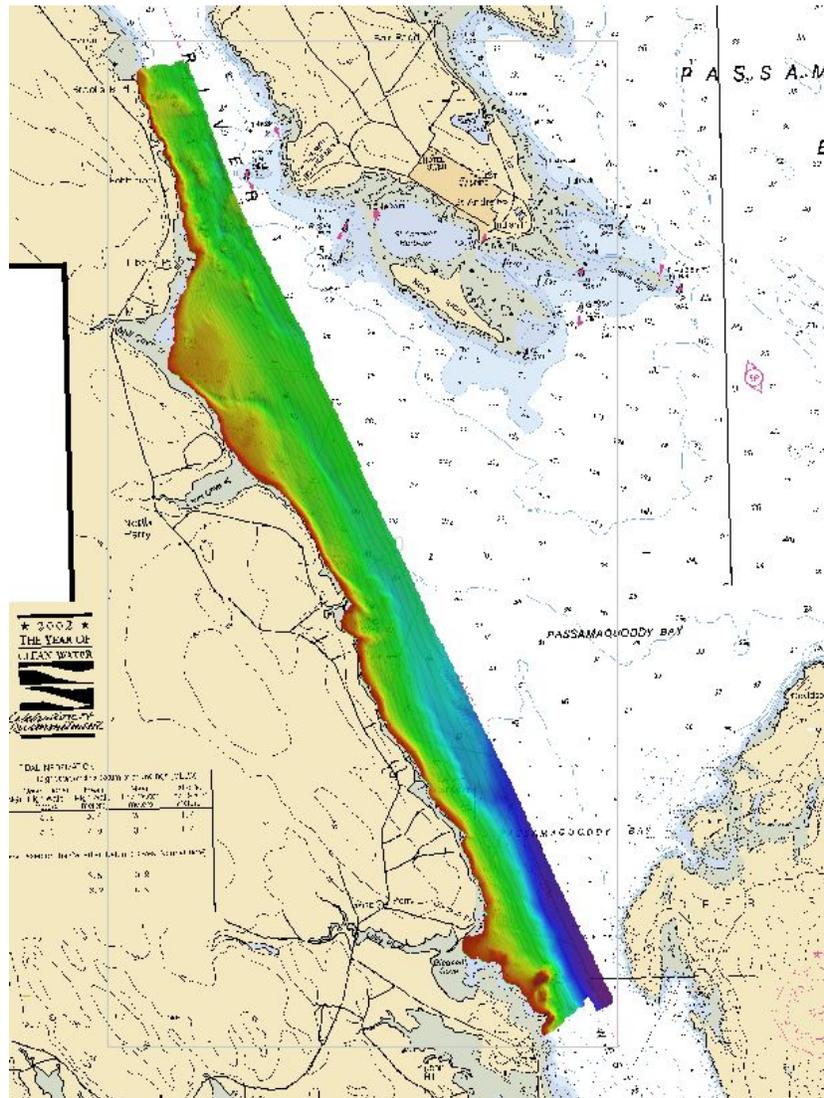


Figure 1: H12270 Survey Area

B. DATA ACQUISITION AND PROCESSING

B.1 EQUIPMENT

Data were acquired by NOAA S3002 (NRT-5). NOAA Survey Vessel S3002 is a 9.8-m (overall) aluminum SeaArk outboard-driven vessel with a nominal multibeam transducer draft of 0.6 meters. NOAA S3002 acquired multibeam bathymetry in the project area. Mainscheme bathymetry data were acquired with a Kongsberg Simrad EM 3002 multibeam echosounder (MBES). Positioning and attitude were determined with an Applanix POS/MV 320 (version 4) GPS aided inertial navigation system. Refer to the *OPR-A375-NRT5-10 Data Acquisition and Processing Report (DAPR)* for a detailed description of the equipment used.

B.2 QUALITY CONTROL

B.2.1 Side Scan Sonar Quality Control

Side Scan Sonar data were not acquired as part of H12270.

B.2.2 Single Beam Quality Control

Single Beam Sonar data were not acquired as part of H12270.

B.2.3 Multibeam Echosounder Quality Control

There were no systematic faults with the MBES system which adversely affected data integrity. Navigation data were reviewed and any fliers were rejected with interpolation. For detailed discussion of MBES system calibrations, data acquisition, and data processing refer to this project's DAPR. Several isolated instances of data integrity are discussed below.

Heave Artifacts

Minor heave artifacts are evident in many areas of the surface. None of the heave artifacts examined exceeded the maximum value of 0.2 meters allowed by the Hydrographic Surveys Specifications and Deliverables (HSSD) section 5.2.3.5. See Figure 2 below.

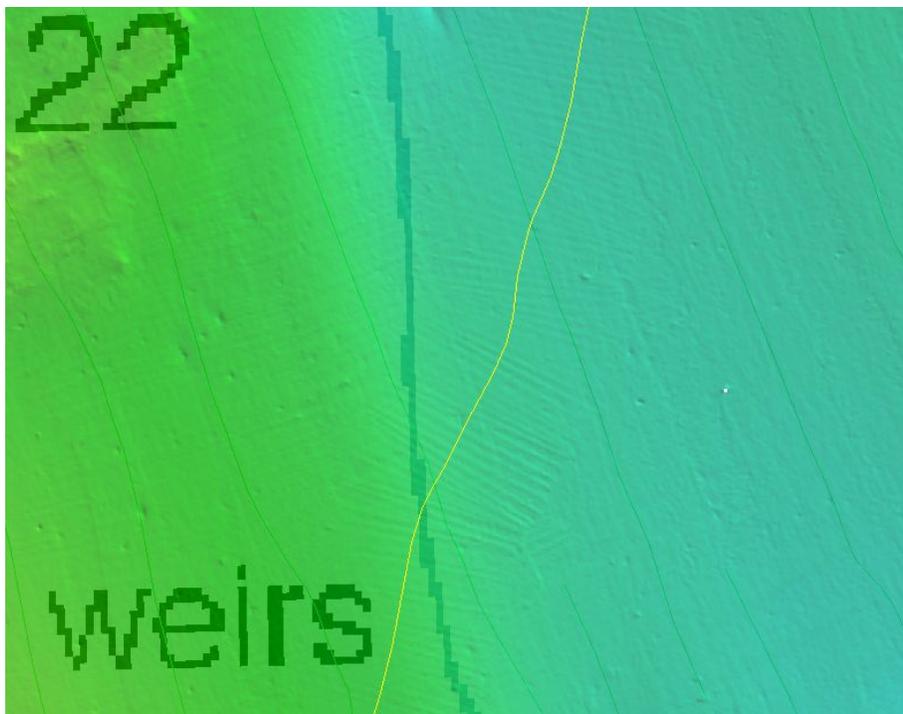


Figure 2: Heave error evident in the surface following the selected line in the vicinity of Loring Cove.

Sound Velocity Errors

Minor sound velocity errors were observed in limited areas of the survey. The only area where the sound velocity error exceeds the allowed error budget is southeast of Loring Cove. The largest divergence observed in the data was 0.57 meters in 40 meters depth, depicted in Figure 3 below. Despite the sound velocity errors in the outer beams, the Hydrographer has examined all data to ensure least depths were represented in the surfaces.

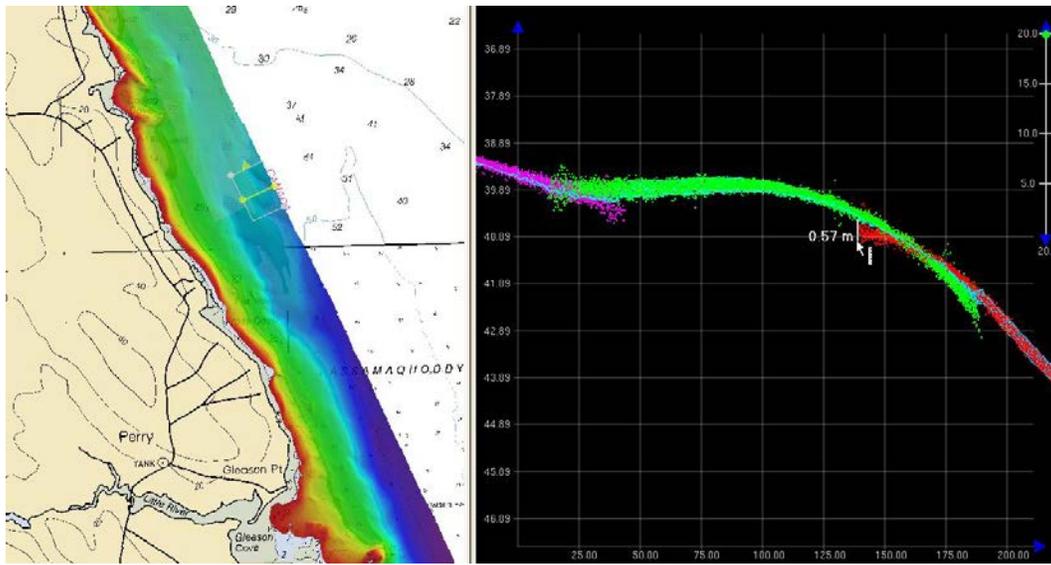


Figure 3: Sound velocity ‘frowns’ in the data south east of Loring Cove.

Horizontal Offsets

Numerous horizontal offsets exist in the data despite using Post Processing Kinematic methods (PPK) for horizontal positioning¹. Most of the horizontal offsets observed range from one to two meters and are most noticeable on slopes, as depicted in figures 4 and 5 below. The maximum horizontal offset observed was 6.5 meters, depicted in Figure 6 below. The positioning problems occurred on multiple days during the survey. The poor positioning was not a result of high horizontal dilution of position or poor satellite visibility due to land masses blocking lines of sight. POS/MV accuracy indicators were monitored during boat days and lines were re-run when accuracies fell below acceptable levels. If future work is planned for this area additional horizontal control stations should be considered to improve the accuracy of the horizontal positions. See section C.2 for additional details regarding the PPK processing workflow.

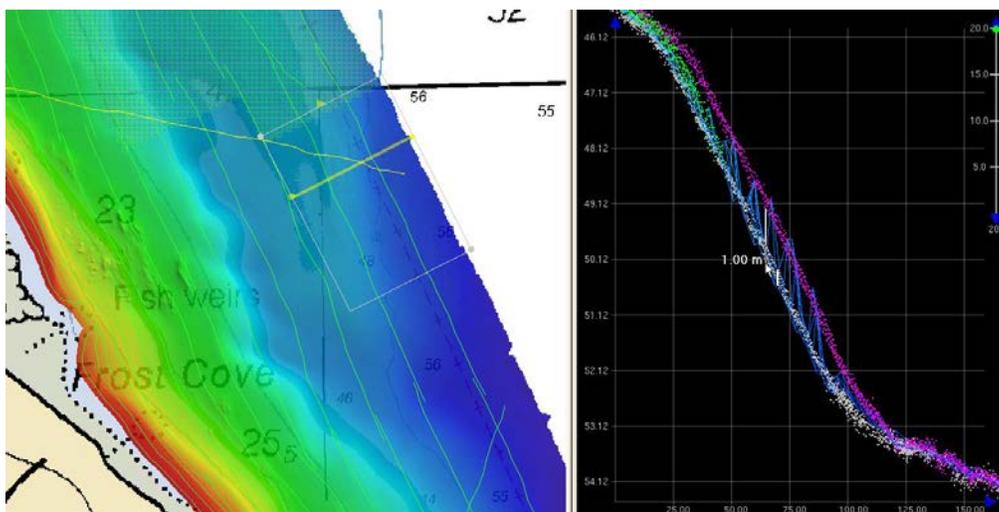


Figure 4: NE of Frost Cove a small horizontal offset creates a significant vertical offset on a slope.

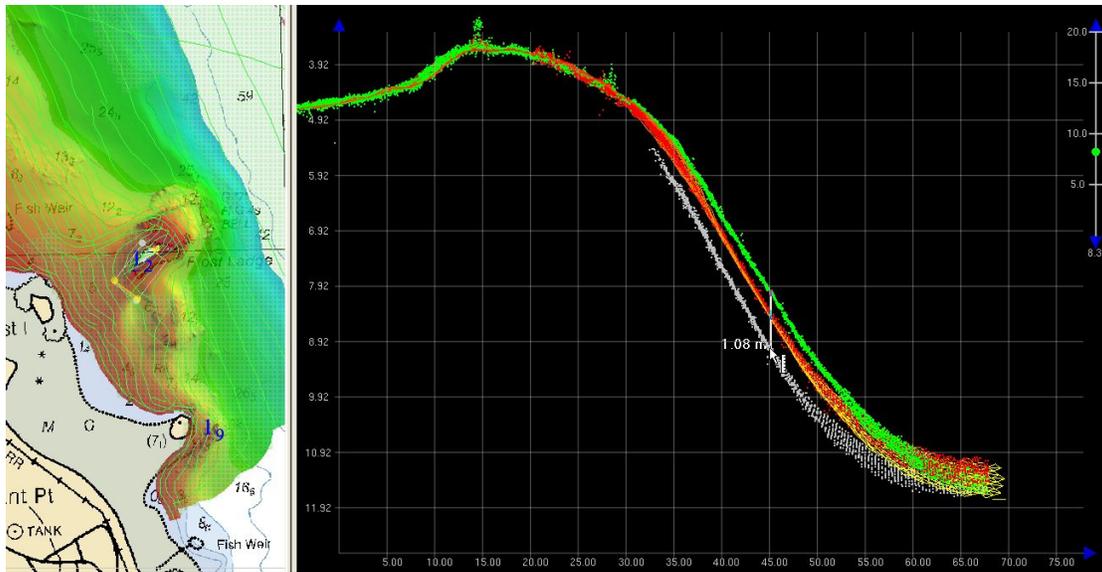


Figure 5: South of Frost Ledge horizontal offsets create three vertical layers on a slope.

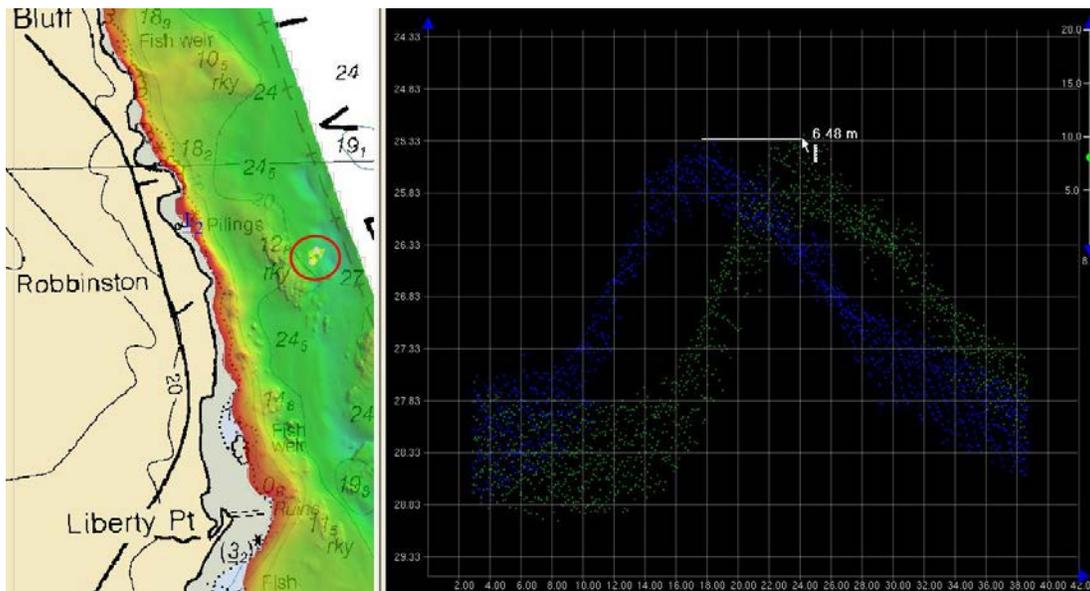


Figure 6: East of Robbinston a maximum 6.48 m horizontal offset was observed.

Holidays

There were several notable gaps in the coverage of H12270, depicted in figures 7 through 9 below. These holidays were a result of post processing navigation data and having several lines of bathymetry adjusted further apart than the real time coverage maps. The two areas affected by these holidays do not have any shoaling trends or nearby prominent features. Backscatter data for these areas were also examined for objects or shoaling trends and none were found².

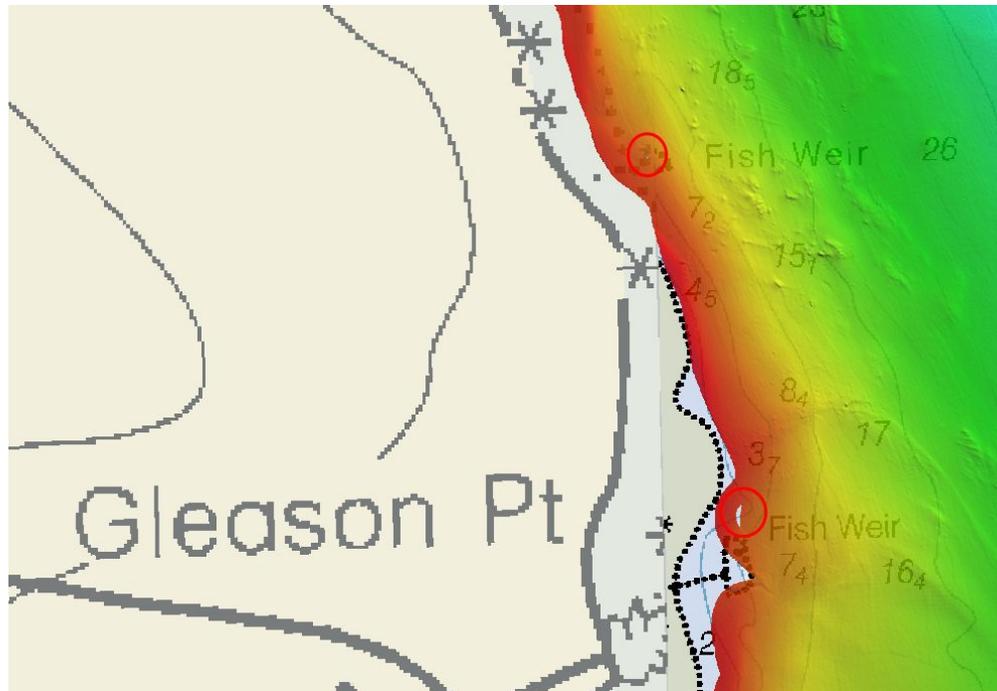


Figure 7: Gaps in coverage near Gleason Pt.

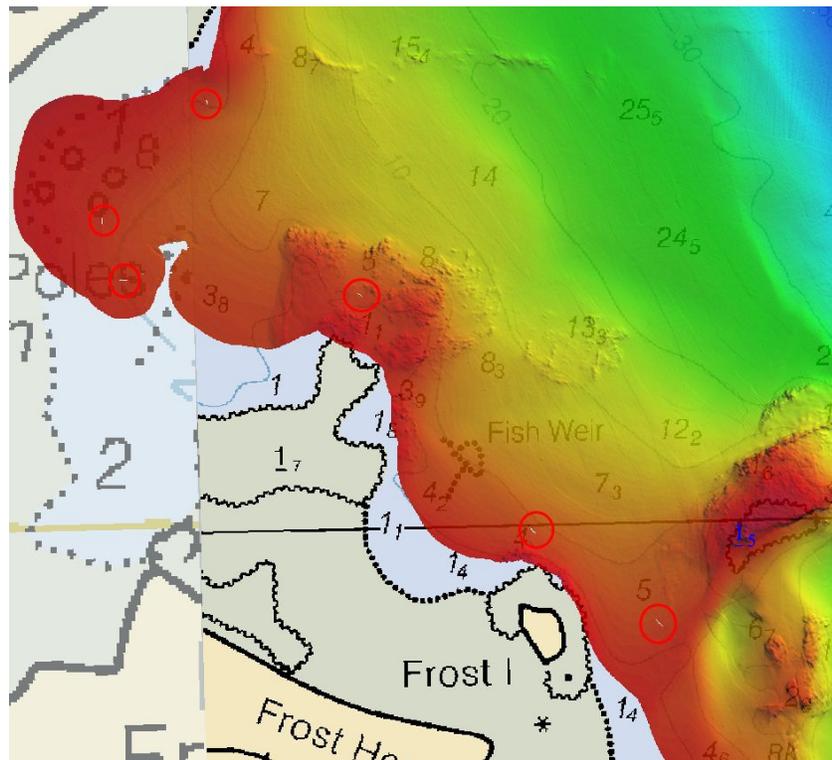


Figure 8: Gaps in coverage near Frost Ledge and Gleason Cove.

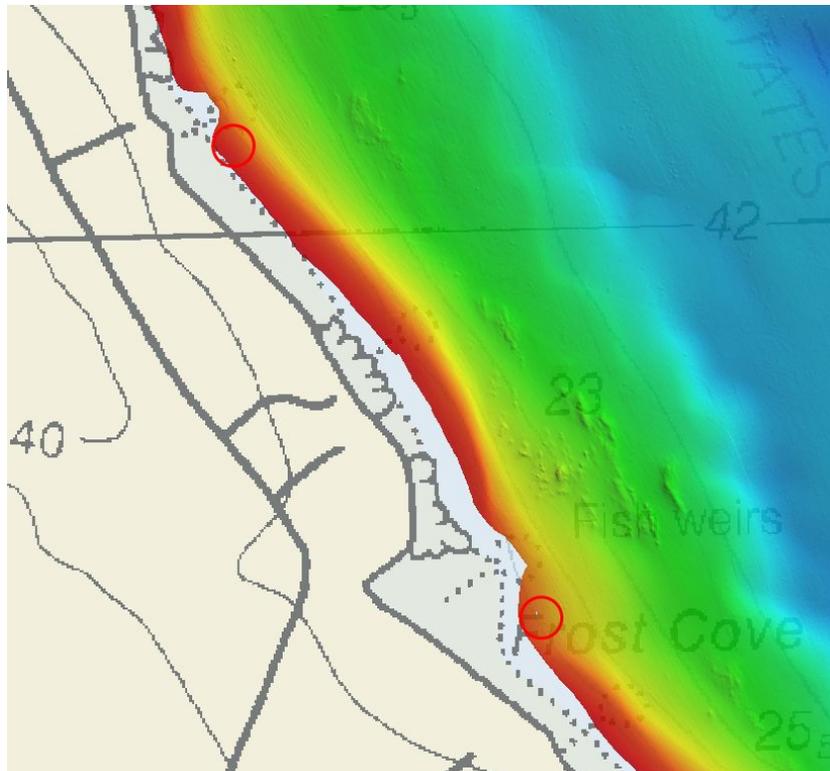


Figure 9: Gaps in coverage near Frost Cove.

B.2.4 Total Propagated Uncertainty

Total Propagated Uncertainty (TPU) parameters for sound speed and tide data for H12270 are shown in Table 2 below. The estimated tidal error contribution to the total survey error budget in the vicinity of Cobscook Bay is included in the tidal zoning file. Sound speed TPU values were used in accordance with HSTP guidelines regarding frequency of surface and water column sound speed measurements. The TPU parameters pertaining to the vessel and the related survey equipment are contained in the HVF.

Table 2: Total Propagated Uncertainty Values for Tide and Sound Speed

| Parameter | Value |
|---------------------|--------------|
| Tide measured | 0.01 m |
| Tide zoning | 0.11 m |
| Sound speed profile | 0.5 m/s |
| Sound speed surface | 0.5 m/s |

B.2.5 Fieldsheets and Navigation Surfaces

Caris HIPS combined uncertainty weighted CUBE surfaces were created for this project. For MBES data, surfaces were created at 1, 2, and 4 meter resolutions. Despite collecting data above the 0 meter curve, finalized depth ranges were limited to positive values due to a limitation of the Caris software (Reference Caris HelpDesk request #01100287). When addressing features in the

H-Cell process it is recommended to use the un-finalized 1 m surfaces for 0 m contour creation. Table 3 below lists all surfaces and mosaics submitted with this survey³.

Table 3: H12270 Bathymetry surfaces

| Fieldsheet | Surface/Mosaic Name | Grid Type | Resolution |
|------------|-----------------------|----------------|------------|
| H12270 | H12270_1m | CUBE | 1 m |
| H12270 | H12270_1m_Final_0-22 | Finalized CUBE | 1 m |
| H12270 | H12270_2m | CUBE | 2m |
| H12270 | H12270_2m_Final_20-44 | Finalized CUBE | 2m |
| H12270 | H12270_4m | CUBE | 4m |
| H12270 | H12270_4m_Final_40-80 | Finalized CUBE | 4m |
| H12270 | H12270_4m_Combined | Combined CUBE | 4m |

B.2.6 Crosslines

For this survey, 7.67 nm of crosslines (4.29% of mainscheme lines) were acquired. A visual examination of approximately 15% of overlap areas showed general agreement between crosslines and mainscheme lines to within 0.3 meters.

B.2.7 Junctions

Survey H12270 junctions with H12259, which is Sheet C of the same project. Visual examination of the junction with H12259 showed agreement between bathymetry data within 0.2 m inshore and 0.5 m in depths greater than 50 m.

B.3 CORRECTIONS TO ECHO SOUNDING

All methods or instruments used were as described in the project DAPR.

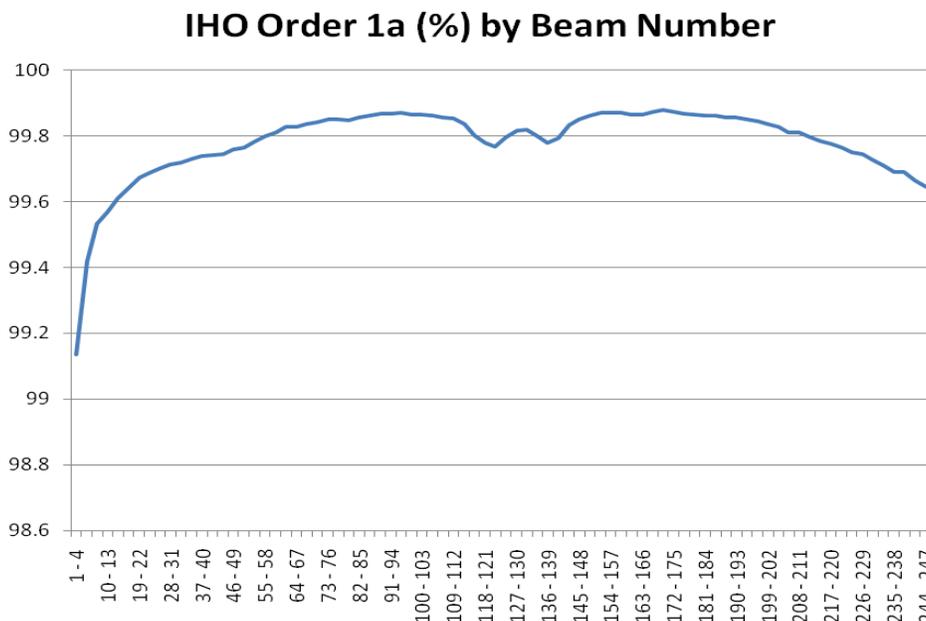


Figure 10: Caris QC report. Greater than 99% IHO Order 1a compliance was achieved across the swath.

B.4 Data Processing

Data processing procedures for survey H12270 conform to those detailed in the DAPR. Data were processed using CARIS HIPS & SIPS v7.0, Service Pack 2, and Hotfix 6. Additional processing details regarding Total Propagated Uncertainty (TPU) and CUBE (Combined Uncertainty and Bathymetry Estimator) Surfaces and Parameters utilized, along with any the deviations from the processing procedures outlined in the DAPR are discussed in section B.2.4.

The CARIS HIPS BASE (Bathymetry Associated with Statistical Error) surfaces delivered with H12270 and their associated resolutions are listed in Table 3. All field sheet extents were adjusted using the *Base 16 Calculator* tool to ensure coincident nodes among all bathymetric surfaces regardless of the field sheet in which they are contained given the standard surface resolutions of one, two, four, eight, and sixteen meters. The NOAA CUBE parameters mandated in HSSD were used for the creation of all CUBE BASE surfaces in Survey H12270.

The surfaces have been reviewed where noisy data, or ‘fliers’ are incorporated into the gridded solution causing the surface to be shoaler than the true seafloor. Where these spurious soundings cause the gridded surface to be shoaler than the reliably measured seabed by greater than the maximum allowable TVU at that depth, the noisy data have been rejected and the surface recomputed.

C. VERTICAL AND HORIZONTAL CONTROL

A *Horizontal and Vertical Control Report* for survey H12270 was not necessary due to field personnel not installing or maintaining any tide gauges or horizontal control stations. All information pertinent to horizontal and vertical control is detailed below.

C.1 VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at Eastport, ME (841-0140) and Pettegrove Point, ME (841-0834) served as datum control for the survey area. A Request for Approved Tides was sent to N/OPS1 on November 03, 2010 (see Appendix IV). The final discrete grid and tide note for H12270 were received on December 08, 2010. Verified water levels from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data⁴.

C.2 HORIZONTAL CONTROL

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 19. Differential correctors from the U.S. Coast Guard beacon at Penobscot, ME (290 kHz) were used during real-time acquisition when not otherwise noted in the acquisition logs. The Post Processing Kinematic method (PPK) is the primary method of horizontal positioning of MBES soundings on H12270. Correctors from the CORS GPS base station in Eastport (CORS ID EPRT) were used for post processing all vessel-day POSMV files. Due to POS data-logging issues not all bathymetry was corrected with Smoothed Best Estimate of Trajectory (SBET) files. Information on which lines were processed using PPK techniques

can be found in: ...\\H12270\Descriptive_Report\Separates\I Acquisition_&_Processing_Logs\H12270_POSPAC_Processing_Log.xlsx. No horizontal control stations were established for this survey.

Despite the use of PPK techniques to process the positioning data, significant horizontal offsets exist in the data⁵. See section B.2.3 Multibeam Echosounder Quality Control for more details.

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON

The following RNCs (raster navigational charts) and ENCs (electronic navigation charts) are affected by H12270⁶:

Table 5: RNCs and ENC's affected by H12270

| RNC | Edition | Edition Date | Scale |
|-------|---------|--------------|----------|
| 13396 | 5 | 05/01/10 | 1:20,000 |
| 13394 | 3 | 07/01/02 | 1:50,000 |
| 13398 | 3 | 03/02/02 | 1:50,000 |

| ENC | Edition | Issue Date |
|----------|---------|------------|
| US5ME55M | 2 | 5/16/11 |
| US5ME56M | 5 | 5/16/11 |
| US5ME57M | 1 | 7/19/10 |

Charts 13394 and 13398 are horizontally displaced from one another by up to 80 meters (See Figure 6 below). Features in the ENC's seem to be based on chart 13394 and do not coincide well with the charted features on 13398.

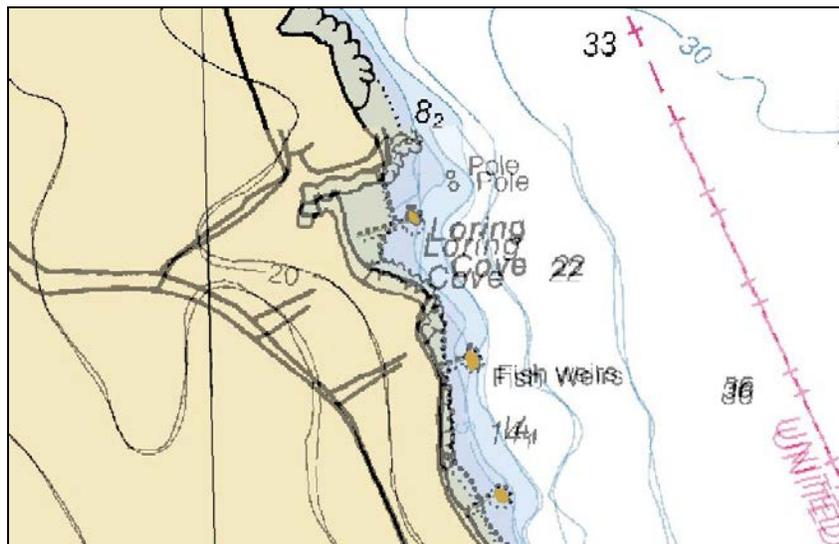


Figure 11: Chart 13398 and 13394 displaced from each other by up to 80 meters.

D.1.1 General Agreement with Charted depths

Sounding data were generally one to two meters deeper than charted. Navigationally significant differences from charted depths are addressed in Appendix II of this report. The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the HSSD. All soundings from H12270 are adequate to supersede prior surveys and charted depths in their common areas.

D.1.2 Dangers to Navigation

There were no DTONs submitted for survey H12270.

D.1.3 AWOIS Items

There was one AWOIS items within the survey limits of H12270. AWOIS item 14798 was covered with 100% MBES. The Hydrographer recommends that the AWOIS item 14798 be updated with new position and attribution in the AWOIS database as per the recommendations and remarks in the PSS⁷.

D.1.4 Shoreline/Features

NRT 5 personnel conducted limited shoreline verification and reconnaissance during the course of regular multibeam survey. Features are addressed digitally in the H12270.pss and summarized in the feature report contained in Appendix II⁸. Five redigitized area features contained in ...H12270\PSS\H12270_Area_Features.000 were created in Hypack ENC Editor due to the lack of ability to create area features in Pydro. These mischarted fish weirs were repositioned with observations from the field and surrounding bathymetry. All charted items not specifically addressed in Appendix II are recommended to be retained as charted by the Hydrographer.

D.2 ADDITIONAL RESULTS

D.2.1 Aids to Navigation

All AToNs within the survey limits of H12270 were visually verified and found to be serving their intended purpose.

D.2.2 Bridges and Overhead Cables

There are no charted bridges or overhead cables within the survey limits of H12270 and none were observed in the field.

D.2.3 Submarine Cables and Pipelines

There are no charted submarine cable areas or pipelines in the survey area and none were detected in the digital data.

D.2.4 Bottom Samples

No bottom samples were collected for this survey⁹.

E. APPROVAL SHEET

**OPR-A375-NRT5-10
H12270
Eastport, ME
Passamaquoddy Bay**

Field operations for this survey were conducted under my daily supervision with frequent checks of progress and adequacy. All fieldsheets, bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

Submitted in association with this descriptive report has been a series of reports and data:

- 2010 Data Acquisition and Processing Report (submitted with this report)
- 2010 HSRR Memo (submitted with this report)
- Tides and Water Levels Package for OPR-A375-NRT5-10 (submitted 11/03/2010 under separate cover)
- Coast Pilot Report for OPR-A375-NRT5-10 (submitted 4/25/2011 under separate cover)

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,



Matt Andring
I am the author of this document
2011.06.16 09:36:29 -04'00'

Matt Andring / NOAA PST
NRT-5



Matthew Nardi
I have reviewed this document
2011.06.16 10:02:16 -04'00'

Matthew Nardi, LTJG
Team Lead NRT-5

Revisions Compiled During Office Processing and Certification

- ¹ The horizontal offsets described were corrected during office processing after the data was remerged using a corrected HVF.
- ² The gaps are insignificant and the data is adequate for charting.
- ³ The 4m combined surface H12270_4m_combined created during office processing was used for compilation.
- ⁴ The Tide Note is attached.
- ⁵ See endnote 1
- ⁶ Chart 13398_3 (1:15,000) encompasses the northeastern part of the survey and was used during compilation.
- ⁷ The AWOIS report is attached.
- ⁸ The Survey Feature Report is filed with the hydrographic records. Note: the survey feature report does not include all features from H12270. Additional features were added, some removed, and some modified in CARIS Notebook after the feature report was generated from Pydro. All features included in the compilation of H12270 have come directly from CARIS Notebook, which is the official features deliverable for this survey.
- ⁹ One charted bottom sample in the survey area was retained.

Survey H12270 AWOIS Report

Registry Number: H12270
State: Maine
Locality: Eastport, ME
Sub-locality: Passamaquoddy Bay
Project Number: OPR-A375-NRT5-10
Survey Dates: 9/16/2010 - 10/25/2010

Charts Affected

| Number | Edition | Date | Scale (RNC) | RNC Correction(s)* |
|--------|---------|------------|-----------------------|---|
| 13398 | 3rd | 03/02/2002 | 1:50,000 (13398_1) | USCG LNM: 12/09/2008 (05/11/2010) CHS NTM: 07/31/2009 (04/30/2010) NGA NTM: 03/29/2008 (05/22/2010) |
| 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. | Feature Type | Survey Depth | Survey Latitude | Survey Longitude | AWOIS Item |
|-----|--------------|--------------|-----------------|------------------|------------|
| 1.1 | Obstruction | 4.30 m | 45° 02' 38.0" N | 067° 05' 49.8" W | 14798 |

1 - DR_AWOIS

1.1) Profile/Beam - 12784/10 from h12270 / nrt5_s3002_em3002_mbes / 2010-280 / 000_1528j

Primary Feature for AWOIS Item #14798

Search Position: 45° 02' 39.1" N, 067° 05' 48.7" W
Historical Depth: [None]
Search Radius: 75
Search Technique: MB, S2, ES
Technique Notes: [None]

History Notes:

**UNKNOWN SOURCE-- An obstruction is charted at 45/55/39.06 - 67/05/48.70.(entered ceh 5/2010)

Survey Summary

Survey Position: 45° 02' 38.0" N, 067° 05' 49.8" W
Least Depth: 4.30 m (= 14.11 ft = 2.352 fm = 2 fm 2.11 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.973 m ; **TVU (TPEv)** ± 0.309 m
Timestamp: 2010-280.15:41:01.217 (10/07/2010)
Survey Line: h12270 / nrt5_s3002_em3002_mbes / 2010-280 / 000_1528j
Profile/Beam: 12784/10
Charts Affected: 13398_1, 13003_1

Remarks:

AWOIS #14798 was detected with 100% multibeam.

Feature Correlation

| Address | Feature | Range | Azimuth | Status |
|--|---------------|-------|---------|---------------------|
| h12270/nrt5_s3002_em3002_mbes/2010-280/000_1528j | 12784/10 | 0.00 | 000.0 | Primary |
| ChartGPs - ENC H12270_Features | Danger 3 | 35.01 | 224.6 | Secondary (grouped) |
| ChartGPs - ENC H12270_Features | Other 3 | 41.83 | 214.4 | Secondary (grouped) |
| H12270_AWOIS | AWOIS # 14798 | 41.83 | 214.4 | Secondary |

Hydrographer Recommendations

Recommend updating position and depth of AWOIS item #14798.

Cartographically-Rounded Depth (Affected Charts):

2 ¼fm (13003_1)

4.3m (13398_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: CATOBS - 1:snag / stump
SORDAT - 20101025
SORIND - US,US,graph,H12270
TECSOU - 3:found by multi-beam
VALSOU - 4.302 m
WATLEV - 3:always under water/submerged

Office Notes: Concur with recommendation to update the position and depth of the obstruction.

Feature Images

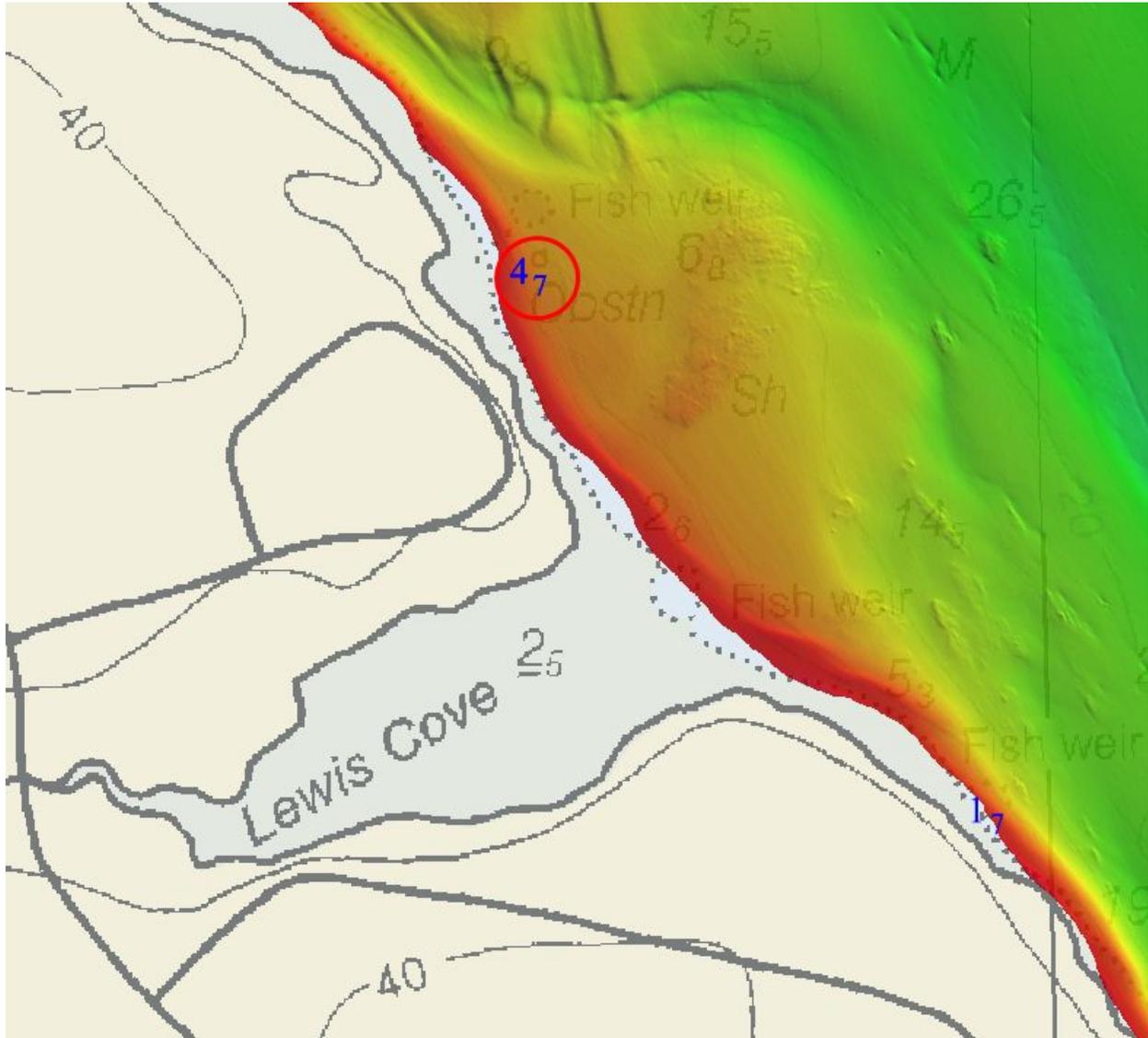


Figure 1.1.1



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : December 8, 2010

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-A375-NRT5-2010
HYDROGRAPHIC SHEET: H12270

LOCALITY: Passamaquoddy Bay, ME
TIME PERIOD: September 16 - October 25, 2010

TIDE STATION USED: 841-0140 Eastport, ME
Lat. 44° 54.3' N Long. 66° 59.0' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 5.729 meters

TIDE STATION USED: 841-0834 Dochet Island, ME
Lat. 45° 07.7' N Long. 67° 08.7' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 6.104 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project
OPR-A375-NRT5-2010

Please use the zoning file "A375NRT52010CORP" submitted with the project
instructions for Eastport, ME. Zones ME7, ME8, ME8, ME9, ME10, & ME11 are
the applicable zones for H12270.

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=NOAA/
NOS/CO-OPS, ou=Oceanographic
Division,
email=peter.stone@noaa.gov, c=US
Date: 2010.12.13 17:35:50 -05'00'

CHIEF, OCEANOGRAPHIC DIVISION



**Preliminary As Final Tidal Zoning for
 OPR-A375-NRT5-2010, H12270
 Passamaquoddy Bay, ME**

841-0834 PETTEGROVE PT., DOCHET IS.

ME11
 Time Corrector 0 mins.
 Range Corrector x0.99
 Reference 841-0834

ME10
 Time Corrector 0 mins.
 Range Corrector x0.98
 Reference 841-0834

ME9
 Time Corrector 0 mins.
 Range Corrector x0.97
 Reference 841-0834

ME8
 Time Corrector 0 mins.
 Range Corrector x0.96
 Reference 841-0834

ME7
 Time Corrector +6 mins.
 Range Corrector x1.01
 Reference 841-0140

841-0140 EASTPORT

13394

UNITED STATES AND CANADA - EAST COAST
 MAINE - NEW BRUNSWICK

GRAND MANAN CHANNEL

NORTHERN PART

Scale 1:50,000 at Lat. 44° 00'
 North American Datum of 1983
 DEPTH IN METERS AND (IN PARENTHESES)
 AT LOWEST LOW WATER

| Depth | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Mean | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 |
| Low | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 |
| High | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 |

3398

PHB Compilation Log

General Survey Info

| | | | | | | | |
|---------------|------------------|-------------------------|-------------------|-------------------|---------|----------|-----|
| Survey Number | H12270 | Field Unit | NRT-5 | State | Maine | UTM Zone | 19N |
| Project Date | OPR-A375-NRT5-10 | Project Name (Locality) | Eastport | | | | |
| Start Date | 09/16/2010 | Sublocality | Passamaquoddy Bay | | | | |
| End Date | 10/25/2010 | Survey Scale | 1:10000 | Compilation Scale | 1:20000 | | |

Affected Raster Charts

| Chart | KAPP | Scale | Edition | Date | NTM Date |
|-------|------|----------|---------|------------|------------|
| 13394 | 2895 | 1:50,000 | 3 | 07/01/2002 | 03/31/2012 |
| 13398 | 2896 | 1:50,000 | 3 | 03/02/2002 | 03/31/2012 |
| 13398 | 2920 | 1:15,000 | 3 | 03/00/2002 | 03/31/2012 |
| 13396 | 2248 | 1:20,000 | 5 | 05/01/2010 | 03/31/2012 |

| | |
|-----------|--------------|
| Add Chart | Remove Chart |
|-----------|--------------|

Affected Electronic Charts

| ENC | Scale |
|----------|----------|
| US5ME55M | 1:50,000 |
| US5ME56M | 1:20,000 |
| US5ME57M | 1:50,000 |

| | |
|---------|------------|
| Add ENC | Remove ENC |
|---------|------------|

Spatial Reference

| | |
|-------------------|-------|
| Horizontal Datum | WGS84 |
| Coordinate System | LLDG |
| Sounding Datum | MLLW |
| Vertical Datum | MHW |

Junction Surveys

| Survey Number | Survey Date | Location Relative to Current Survey |
|---------------|-------------|-------------------------------------|
| H12259 | 10/13/2010 | South |

| | |
|------------|---------------|
| Add Survey | Remove Survey |
|------------|---------------|

PHB Compilation Log

Processing Info

SAR Reviewer
HCell Compiler
HCell Reviewer

| Source Surfaces | |
|-----------------|--------------------|
| Resolution | File Name |
| 4m | H12270_4m_combined |
| Add Surface | Remove Surface |

| Supporting Documents | |
|------------------------|------------|
| Name | Version |
| Specs and Deleverables | April 2011 |
| HCell Specs | 6.1 |
| Add Doc | Remove Doc |

Select Software Used

| Software | Version, Hot Fix | Used For |
|-------------------------------|------------------|---|
| CARIS HIPS | 7.1 | SAR Review. Inspection of Combined BASE Surfaces. |
| Pydro | 11.8 | SAR Review. Generation of Features Reports. |
| CARIS BASE Editor | 3.2 SP2 | Creation of soundings and bathy-derived features, meta area object, and Blue Notes; Survey evaluation and verification; Initial HCell assembly. |
| CARIS S-57 Composer | 2.2 HF3 | Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA. |
| CARIS Plot Composer | 5.1 SP2 | Generate plots of CARIS Session files used for QC. |
| HydroService, dKart Inspector | 6.0 | Validation check of the base cell file. |

Reset Table

Product Info

| Deleverables | |
|----------------------|--|
| Survey Scale HCell | <input type="text" value="H12270_SS.000"/> |
| HCell Report for MCD | <input type="text" value="H12270_HR.pdf"/> |
| Feature Listing | <input type="text"/> |
| Descriptive Report | <input type="text" value="H12270_DR.pdf"/> |
| Survey Outline | <input type="text" value="H12270_Outline.gml and .xsd"/> |
| Chart Scale HCell | <input type="text" value="H12270_CS.000"/> |

| Horizontal and Vertical Units | |
|--|-------------------------------------|
| During creation of the HCell all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. | |
| Depth Units (DUNI) | <input type="text" value="Meters"/> |
| Positional Units (PUNI) | <input type="text" value="Meters"/> |
| Height Units (HUNI) | <input type="text" value="Meters"/> |

PHB Compilation Log

| Radius Setting | | |
|--|----------------|-----------|
| A survey-scale sounding (SOUNDG) feature object layer was built from the Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at survey scale using a Radius Table file with values shown below. | | |
| Radius (mm) | Min. Depth (m) | Max Depth |
| 2 | 0 | 10 |
| 3 | 10 | 20 |
| 3.5 | 20 | 50 |
| 4 | 50 | 100 |

| Contours | | | |
|--|-------------------|---------------------|----------------------|
| Depth contours at the intervals on the largest scale chart are included in the SS HCell for MCD raster charting division to use for guidance in creating chart contours. With the exception of the zero contours included in the *_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography. | | | |
| Charted Contours | Metric Equivalent | Metric NOAA Rounded | Charted NOAA Rounded |
| 0 | 0 | 0.075 | 0.075 |
| 2 | 2 | 2.075 | 2.075 |
| 5 | 5 | 5.075 | 5.075 |
| 10 | 10 | 10.075 | 10.075 |
| 20 | 20 | 20.075 | 20.075 |
| 30 | 30 | 30.75 | 30.75 |
| 50 | 50 | 50.75 | 50.75 |
| Add Contour | Remove Contour | | |

Additional Info

| Contact Information | |
|---|---------------------|
| Inquiries regarding this HCell content or construction should be directed to: | |
| HCell Compiler | Kurt Brown |
| Phone Number | 206 526-6730 |
| Email | kurt.brown@noaa.gov |

| Compilation Comments |
|---|
| This survey was compiled in metric units. A Geospatial pdf product, H12270_Geolmage.pdf, was created and archived for this survey. |

APPROVAL SHEET
H12270

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproof of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the HCell, accompanying data, and reports. This survey and accompanying digital data meet or exceed OCS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.