

**F00617**

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

**DESCRIPTIVE REPORT**

Type of Survey: Field Examination

Registry Number: F00617

**LOCALITY**

State(s): Alaska

General Locality: Arctic Ocean

Sub-locality: Vicinity of Point Belcher

**2012**

CHIEF OF PARTY  
CDR James M. Crocker, NOAA

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**F00617**

**INSTRUCTIONS:** The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State(s): **Alaska**

General Locality: **Arctic Ocean**

Sub-Locality: **Vicinity of Point Belcher**

Scale: **25000**

Dates of Survey: **08/10/2012 to 08/10/2012**

Instructions Dated: **08/02/2012**

Project Number: **S-S928-FA-12**

Field Unit: **NOAA Ship *Fairweather***

Chief of Party: **CDR James M. Crocker, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by:

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

**Remarks:**

*The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.*

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## Descriptive Report to Accompany Survey F00617

Project: S-S928-FA-12

Locality: Arctic Ocean

Sublocality: Vicinity of Point Belcher

Scale: 1:25000

August 2012 - August 2012

**NOAA Ship *Fairweather***

Chief of Party: CDR James M. Crocker, NOAA

### A. Area Surveyed

The survey area is located in the Arctic Ocean/Chukchi Sea, AK. within the sublocality in the vicinity of Point Belcher.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
71° 32' 11' N 160° 37' 8' W	72° 57' 3' N 160° 32' 11' W

*Table 1: Survey Limits*

The Arctic Wreck survey was of lowest priority during the Arctic reconnaissance survey. Due to time limitations, only partial ship MBES was collected over the course of the survey.

#### A.2 Survey Purpose

The goal of this project is to conduct a hydrographic survey using sidescan sonar and/or multibeam to discover the remains of historic whaling ships lost off Alaska's Arctic Coast. Refer to the "Fairweather Arctic Cruise Maritime Archeology Proposal" included in the Project Instructions for additional information. This project is the lowest priority piggyback project for Arctic surveys; all other OCS piggyback projects take priority.

### A.3 Survey Quality

The entire survey is adequate to supersede previous data.

The data collected for survey F00617 does meet IHO Order 1 and 2 specifications. There is no previous contemporary data collected for this survey area; the survey is deemed adequate to supersede the chart.

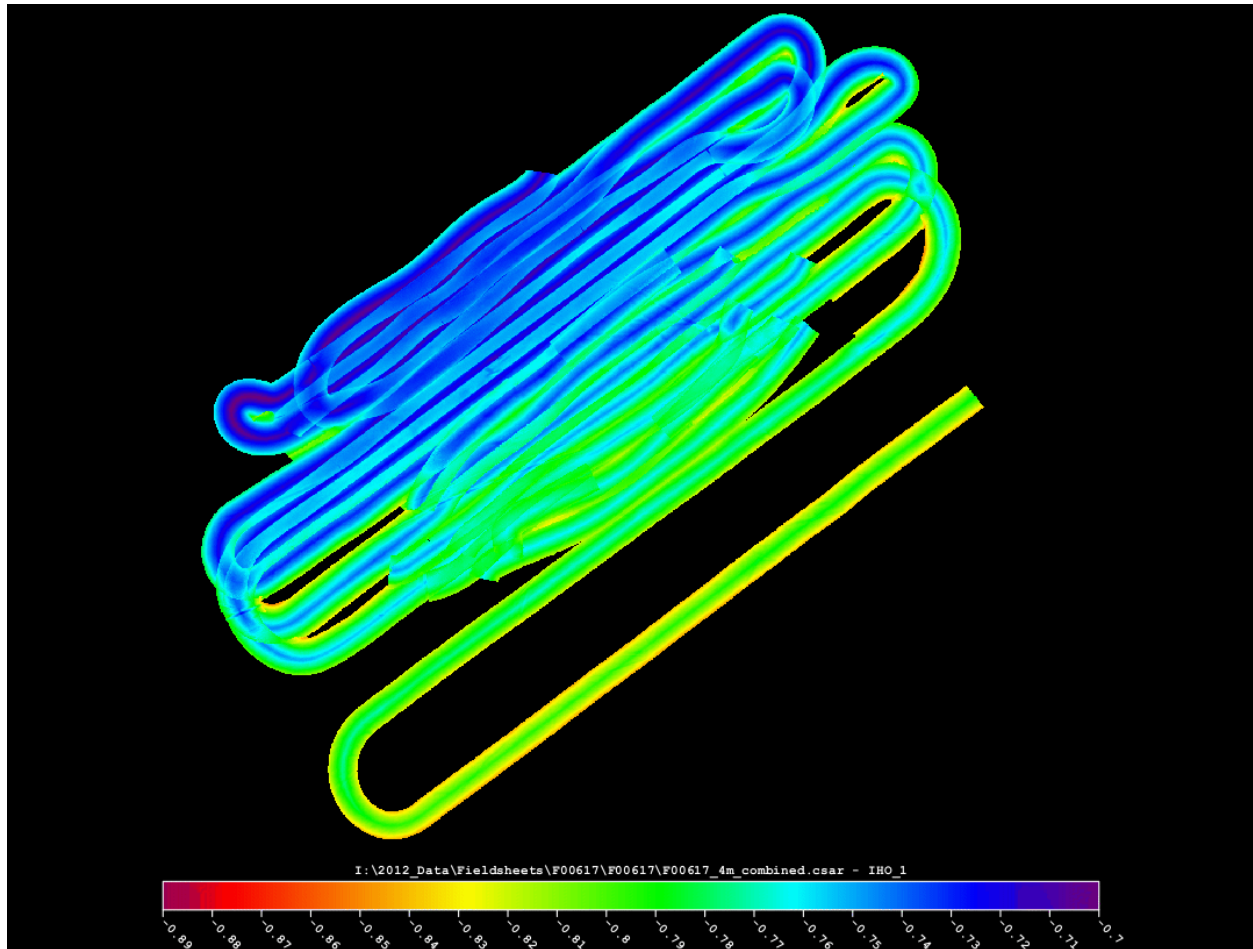
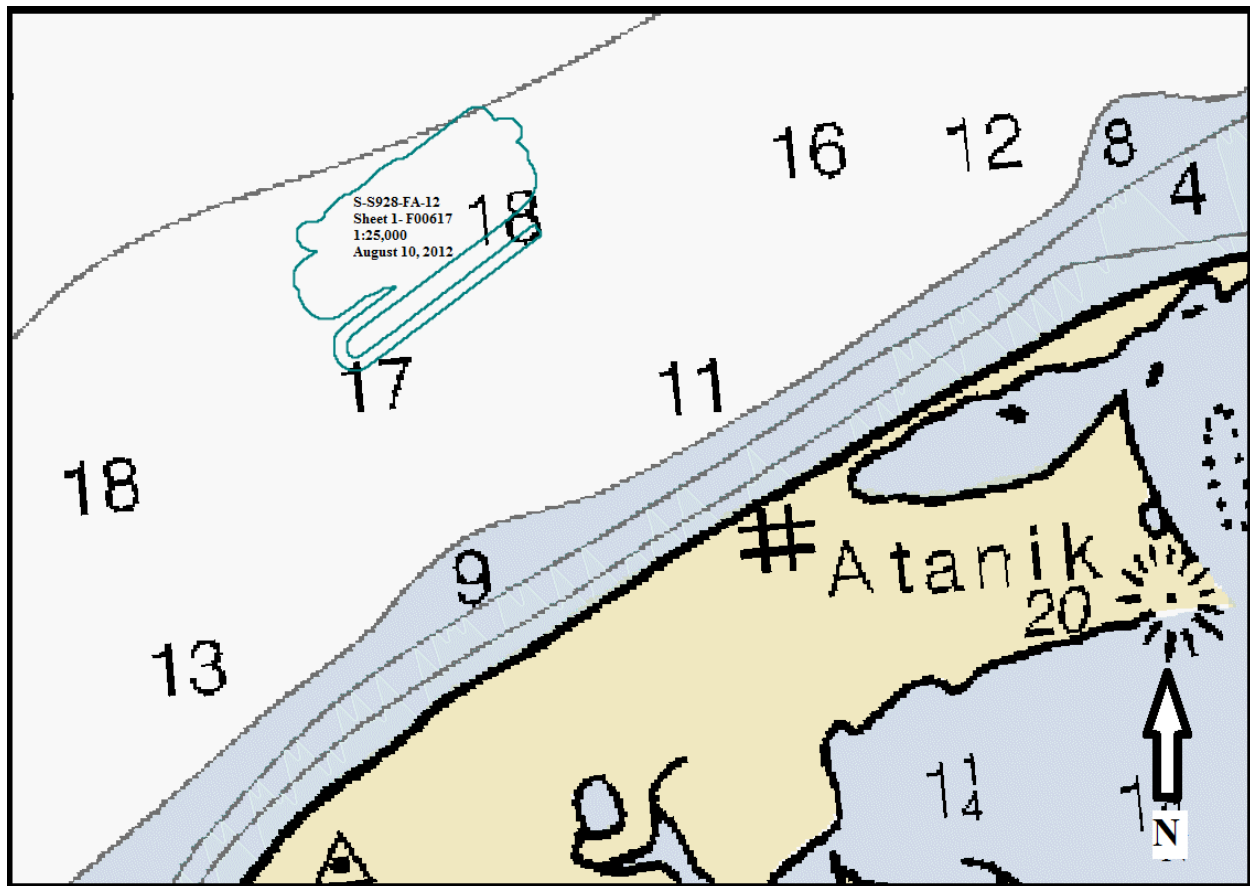


Figure 1: F00617 combined finalized IHO\_1 child layer

## A.4 Survey Coverage



*Figure 2: F00617 Survey Outline*

100% Multibeam echosounder coverage was collected for this survey. The highest resolution data possible was collected within the limited time window available. Only one search area on Sheet 1 was completed.



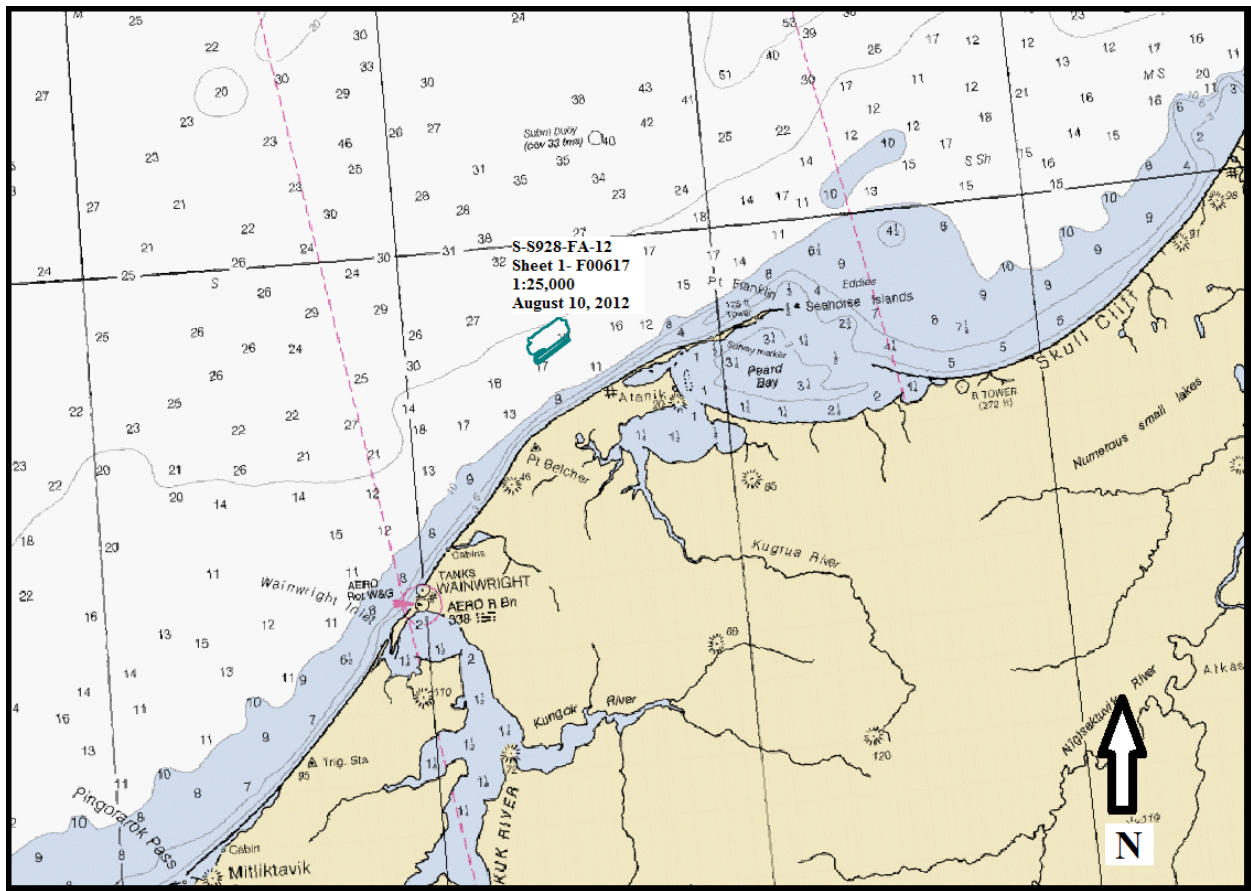


Figure 3: F00617 Overview Survey Outline

## A.5 Survey Statistics

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

	Vessel	<i>S 220</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0
	<b>MBES Mainscheme</b>	72.98	72.98
	<b>Lidar Mainscheme</b>	0	0
	<b>SSS Mainscheme</b>	0	0
	<b>SBES/MBES Combo Mainscheme</b>	0	0
	<b>SBES/SSS Combo Mainscheme</b>	0	0
	<b>MBES/SSS Combo Mainscheme</b>	0	0
	<b>SBES/MBES Combo Crosslines</b>	0	0
	<b>Lidar Crosslines</b>	0	0
	<b>Number of Bottom Samples</b>		0
<b>Number AWOIS Items Investigated</b>		0	
<b>Number Maritime Boundary Points Investigated</b>		0	
<b>Number of DPs</b>		0	
<b>Number of Items Items Investigated by Dive Ops</b>		0	
<b>Total Number of SNM</b>		3.464	

Table 2: Hydrographic Survey Statistics

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

<b>Survey Dates</b>	<b>Julian Day Number</b>
08/10/2012	223

*Table 3: Dates of Hydrography*

## **B. Data Acquisition and Processing**

### **B.1 Equipment and Vessels**

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

#### **B.1.1 Vessels**

The following vessels were used for data acquisition during this survey:

<b>Hull ID</b>	<i>S 220</i>
<b>LOA</b>	70.4 meters
<b>Draft</b>	4.7 meters

*Table 4: Vessels Used*

### B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
RESON	7111	MBES
RESON	8160	MBES
Brooke Oean Technology Ltd	MVP200	Sound Speed System
Applanix	POS/MV V4	Positioning and Attitude System
RESON	SVP70	Sound Speed System

*Table 5: Major Systems Used*

*Only data from Reson 8160 were acceptable for application to the chart update product.*

## B.2 Quality Control

### B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 0% of mainscheme acquisition.

Crosslines were not collected per NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSD), April 2012

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

<b>Measured</b>	<b>Zoning</b>
0.01 meters	0.1785 meters

*Table 6: Survey Specific Tide TPU Values*

<b>Hull ID</b>	<b>Measured - CTD</b>	<b>Measured - MVP</b>	<b>Surface</b>
S 220		1 meters/second	0.5 meters/second

*Table 7: Survey Specific Sound Speed TPU Values*

### B.2.3 Junctions

There are no contemporary surveys that junction with this survey. Project M-S974-FA-12, survey D00168 is reconnaissance data in the North Arctic Region that was also collected during the 2012 survey season but is not a junction survey.

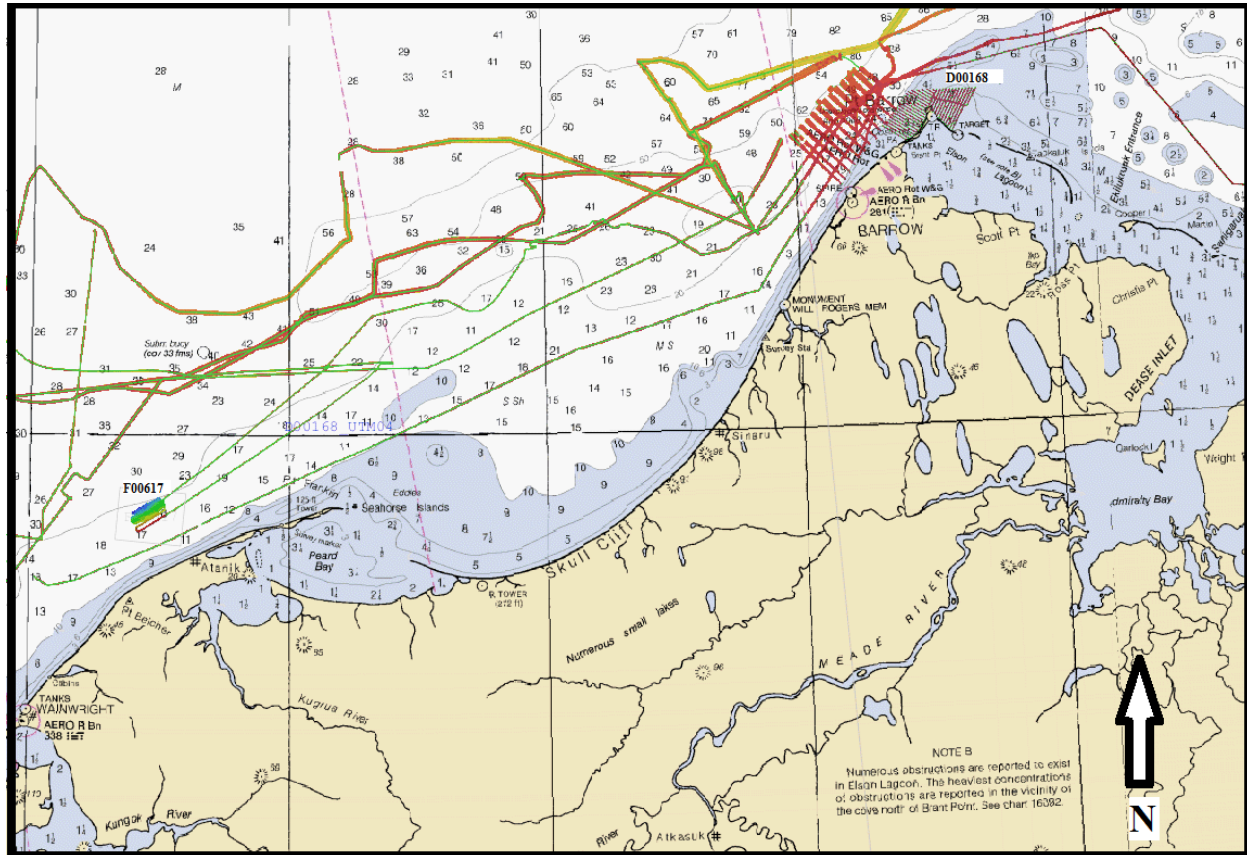


Figure 4: Overview of Survey F00617 and survey D00168 track lines

There are no contemporary surveys that junction with this survey.

### B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

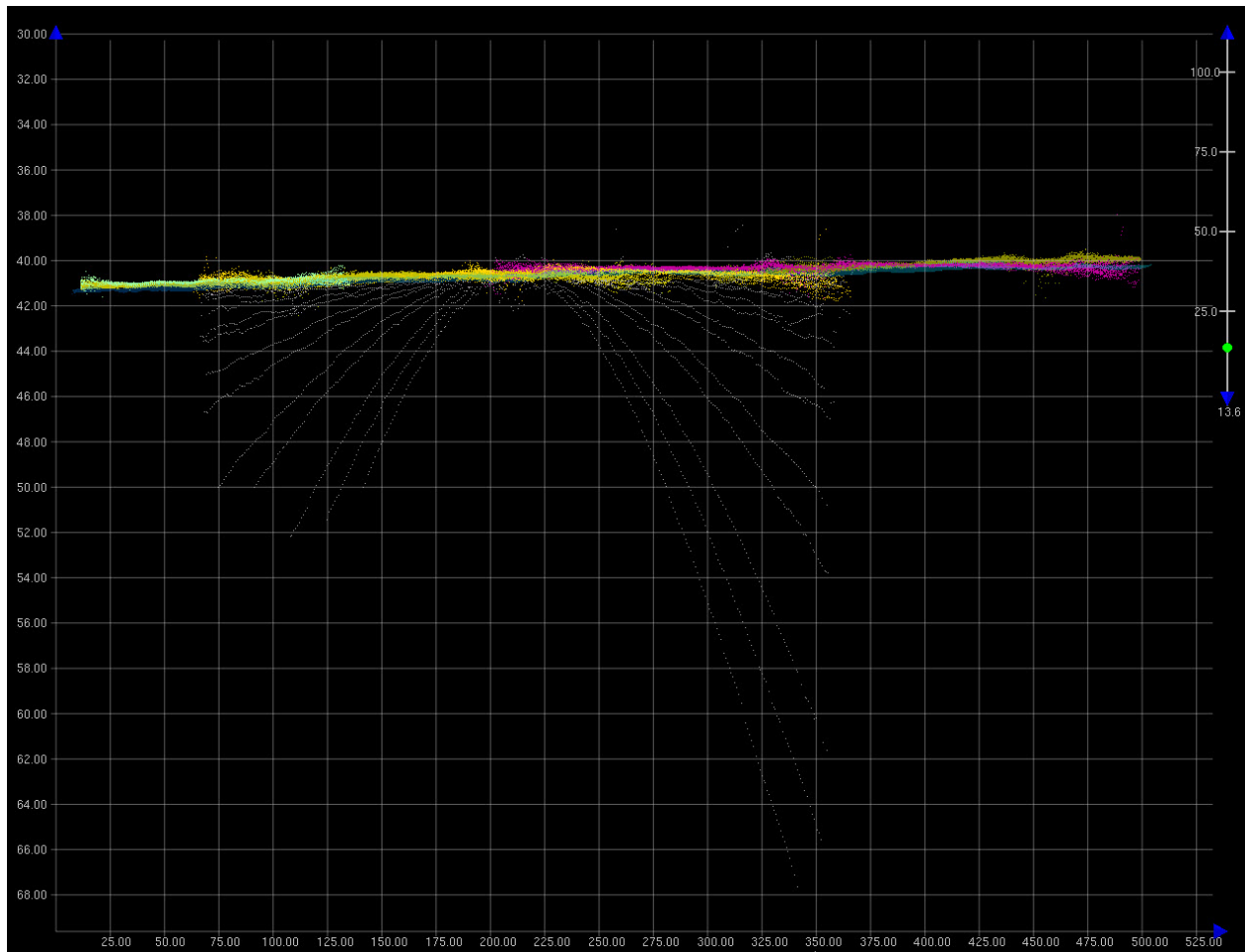
### B.2.5 Equipment Effectiveness

There were no conditions or deficiencies that affected equipment operational effectiveness.

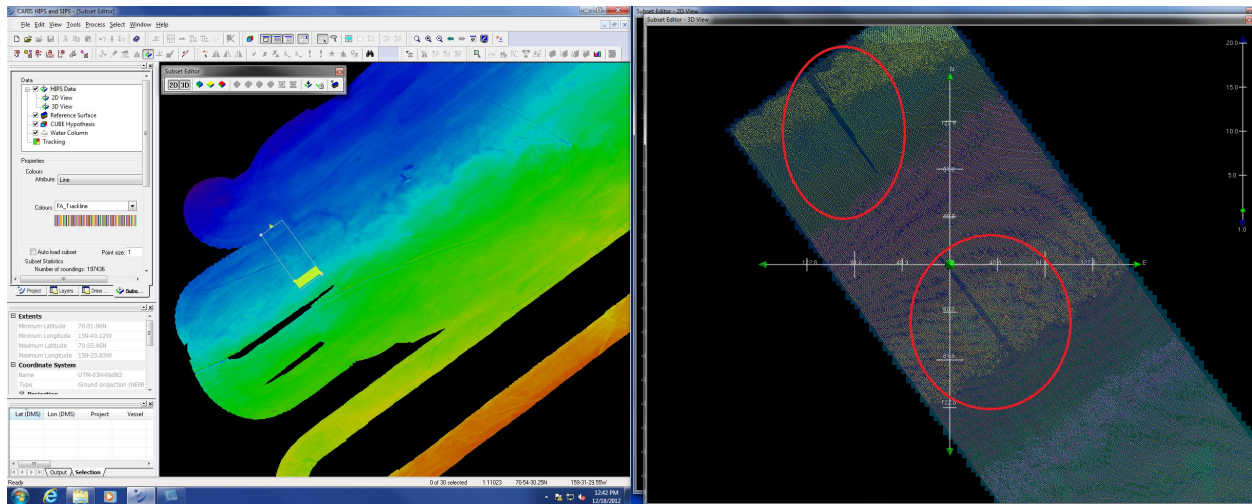
## B.2.6 Factors Affecting Soundings

### Surface Sound Speed Sensor

Due to swell in the project area, brief periods of extreme refraction occurred when air bubbles flowed down the hull causing erroneous measurements for the surface sound speed sensor. An example of the erroneous measurements in surface sound speed and the refracted multibeam outer beams can be seen below.



*Figure 5: Outer beam refraction due to erroneous surface sound speed values.*



*Figure 6: Outer beam refraction due to erroneous surface sound speed values. Data is adequate and within specifications to supersede charted data in the common area.*

### B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed measurements were conducted and applied as discussed in the Corrections to Echo Soundings section of the DAPR.

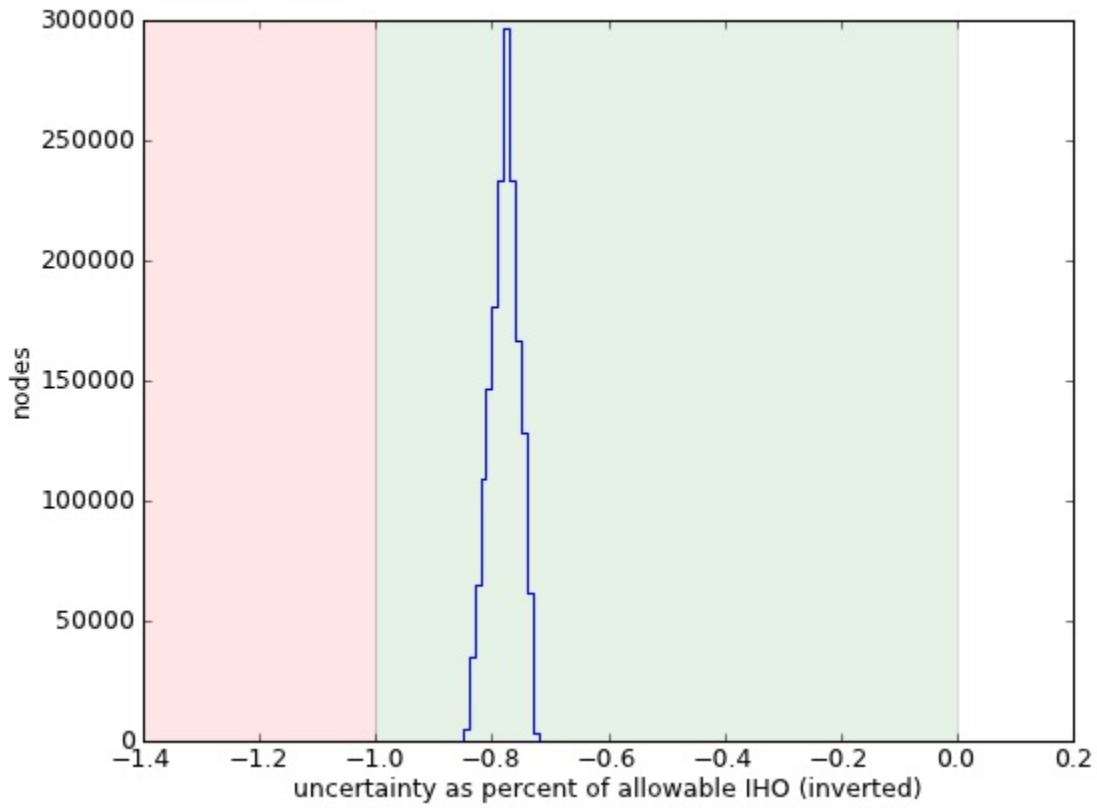
For MVP deployment, the cast frequency was set to 15 to 30 minutes to compensate for the high sound speed variability in the area.

### B.2.8 Coverage Equipment and Methods

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

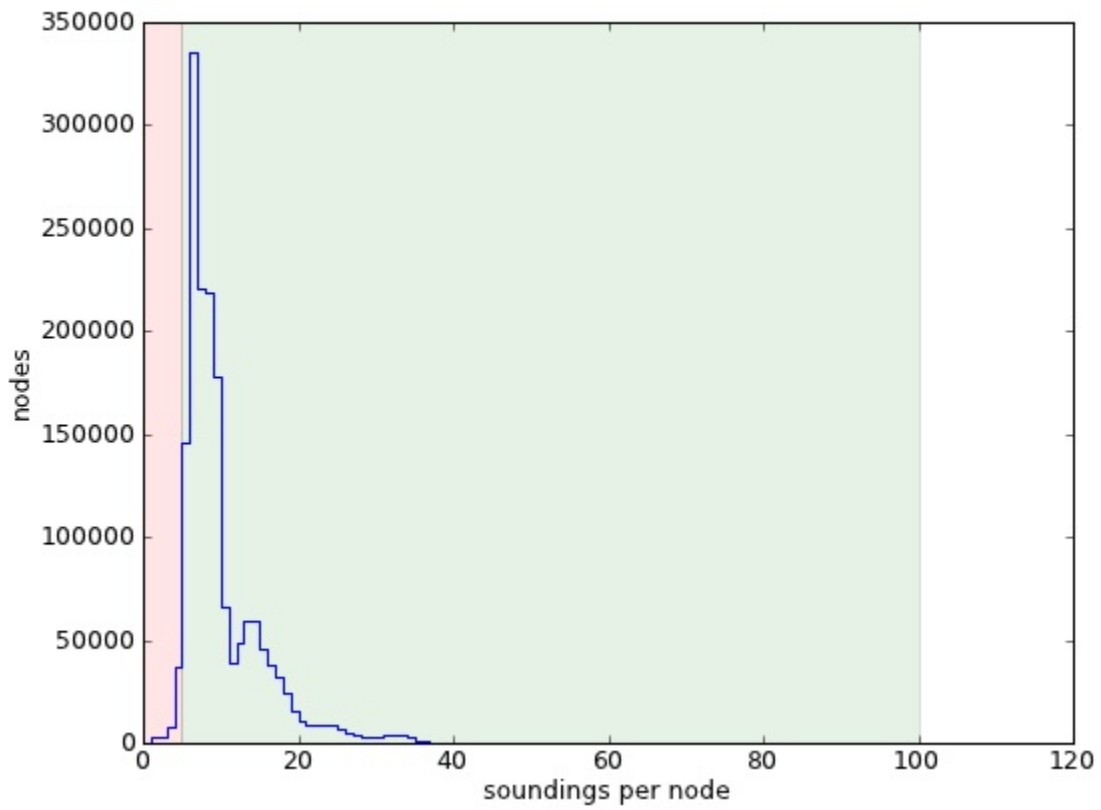
### B.2.9 IHO Uncertainty

After filtering the Reson 7111 data to 68 degrees off nadir, it was found that 100% of nodes in the 2m finalized surface and 100% in the 4m finalized surface meet IHO Order1 specifications as stated in the NOS Hydrographic Surveys Specifications and Deliverables (HSSD) dated April 2012. 96.96% and 100% of the surface nodes for the 2m and 4m surfaces respectively, meet IHO Order 2 specifications. See Standards and Compliance Review in Appendix V for additional information.

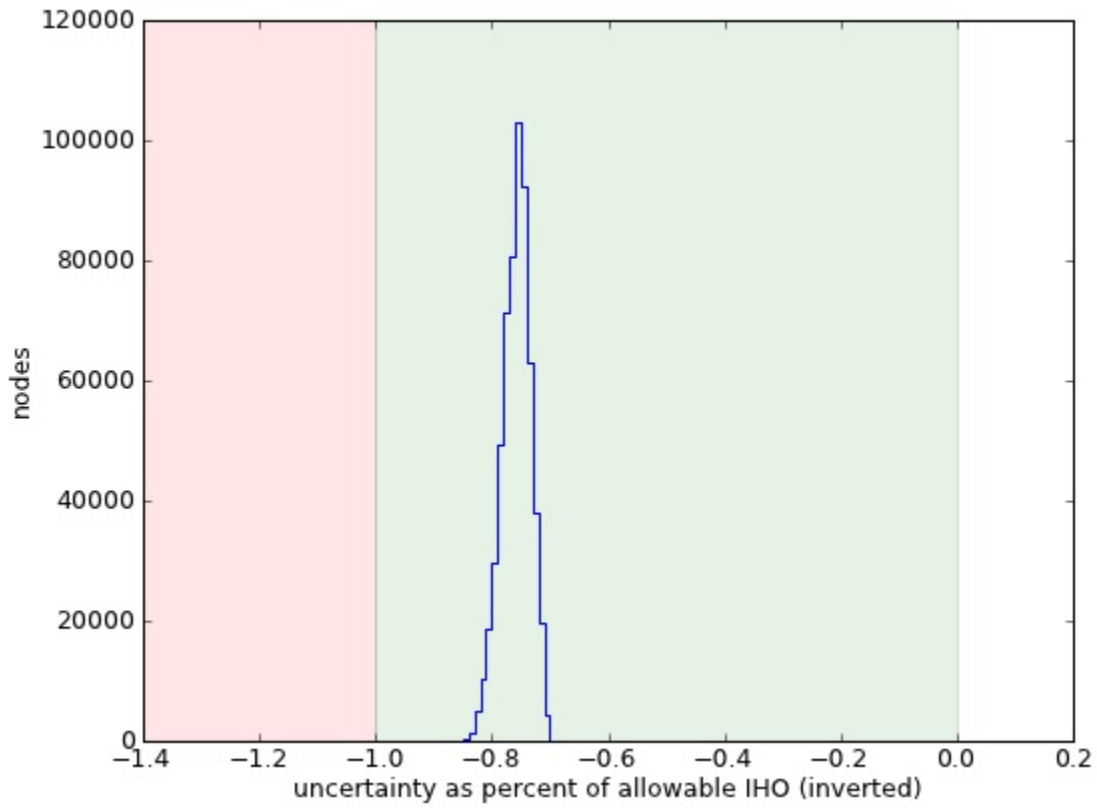


*Figure 7: 2m finalized surface IHO graph*

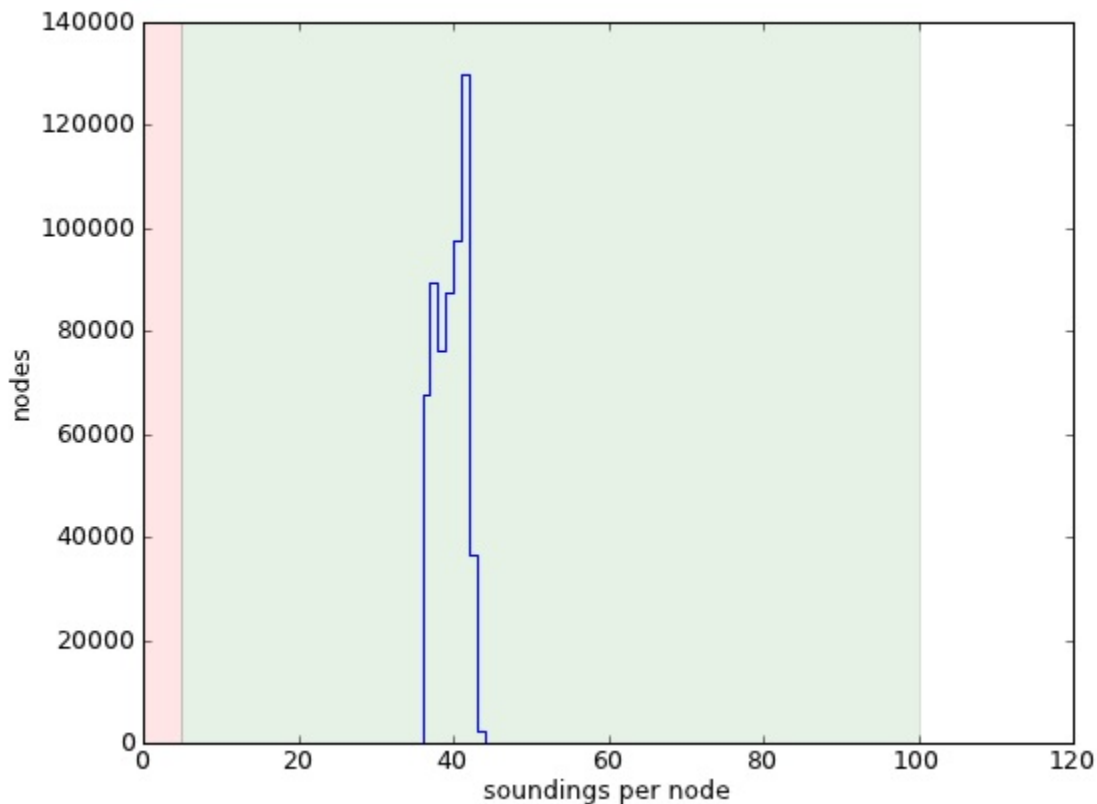




*Figure 8: 2m finalized surface Density graph*



*Figure 9: 4m finalized surface IHO graph*



*Figure 10: 4m finalized surface Density graph*

### **B.2.10 Density**

Density requirements for the 2m and 4m finalized surfaces were achieved with at least 97% of finalized surface nodes containing five or more soundings. See Standards Compliance Review in Appendix V for additional information.

### **B.2.11 Holiday Assessment**

Complete multibeam coverage was obtained within the limits of F00617 except for the holidays noted below. The corresponding multibeam side scan was examined for all holidays larger than three nodes, and no navigationally significant items were found. The least depths of all navigationally significant features are represented by this survey.

## B.3 Echo Sounding Corrections

### B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

## B.4 Backscatter

Backscatter was logged as a 7k file and submitted directly to NGDC to be archived and to PHB where the data will be processed.

## B.5 Data Processing

### B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used:

### B.5.2 Surfaces

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00617_2m	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Object Detection
F00617_4m	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Object Detection
F00617_2m_Final_18to40	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Object Detection
F00617_4m_Final_36to80	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Object Detection
F00617_4m_Combined	CUBE	4 meters	18 meters -	NOAA_4m	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
			80 meters		

*Table 8: Submitted Surfaces*

The surfaces have been reviewed and where noisy data, or 'fliers' are incorporated into the gridded solution causing the surface to be shoaler than the true sea floor, and 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 and refinalized. All multibeam data has been filtered to 68/68 degrees from nadir rejecting the outermost beams. Data was reaccepted where any holidays were created. Both the RESON 8160 and 7111 data were collected for this project. However, the RESON 7111 data has been analyzed to supersede the charted soundings and the 7111 data has only been used to make the submitted field sheets for this project. The RESON 8160 data has been submitted but for archive purposes only.

## C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

### C.1 Vertical Control

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

#### Standard Vertical Control Methods Used:

Discrete Zoning

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

Station Name	Station ID
Prudhoe Bay	9497645

*Table 9: NWLON Tide Stations*

File Name	Status
9497645.tid	Final Approved

*Table 10: Water Level Files (.tid)*

<b>File Name</b>	<b>Status</b>
F00617CORF.zdf	Final

*Table 11: Tide Correctors (.zdf or .tc)*

A request for final approved tides was sent to N/OPS1 on 08/27/2012. The final tide note was received on 09/14/2012.

*Tide note is appended to this report*

## **C.2 Horizontal Control**

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

The projection used for this project is UTM 3N.

## **C.3 Additional Horizontal or Vertical Control Issues**

### **3.3.1 WAAS Correctors**

The Fairweather used an Integrated Differential GPS (DGPS) system offered within the POS MV 320 unit with BD960 receiver card for real-time positioning of the ship for this project. This provides the option of using Satellite- Based Augmentation Systems (SBAS) - such as WAAS - for real-time decimeter level accuracy in position data. For additional information on WAAS, see section 1.4.3 of the DAPR.

An adequate satellite constellation was also maintained throughout the project with 6-12 satellites in view.

## D. Results and Recommendations

### D.1 Chart Comparison

#### D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNМ Date	NM Date
16082	1:50000	6	12/2003	04/05/2014	04/05/2014

*Table 12: Largest Scale Raster Charts*

#### 16082

Soundings from survey F00617 generally agreed within 1 fathom with charted depths on chart 16082.

#### D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US2AK92	1:700000	7	05/02/2011	12/08/2011	NO

*Table 13: Largest Scale ENCѕ*

#### US2AK92

In general, the ENC US2AK92 matches chart raster16082.

#### D.1.3 AWOIS Items

No AWOIS items exist for this survey.

**D.1.4 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

**D.1.5 Charted Features**

No charted features exist for this survey.

**D.1.6 Uncharted Features**

No uncharted features exist for this survey.

**D.1.7 Dangers to Navigation**

No Danger to Navigation Reports were submitted for this survey.

**D.1.8 Shoal and Hazardous Features**

No shoals or potentially hazardous features exist for this survey.

**D.1.9 Channels**

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

**D.1.10 Bottom Samples**

No bottom samples were required for this survey.

**D.2 Additional Results****D.2.1 Shoreline**

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

**D.2.2 Prior Surveys**

No prior survey comparisons exist for this survey.



**D.2.3 Aids to Navigation**

Aids to navigation (ATONs) do not exist for this survey.

**D.2.4 Overhead Features**

Overhead features do not exist for this survey.

**D.2.5 Submarine Features**

Submarine features do not exist for this survey.

**D.2.6 Ferry Routes and Terminals**

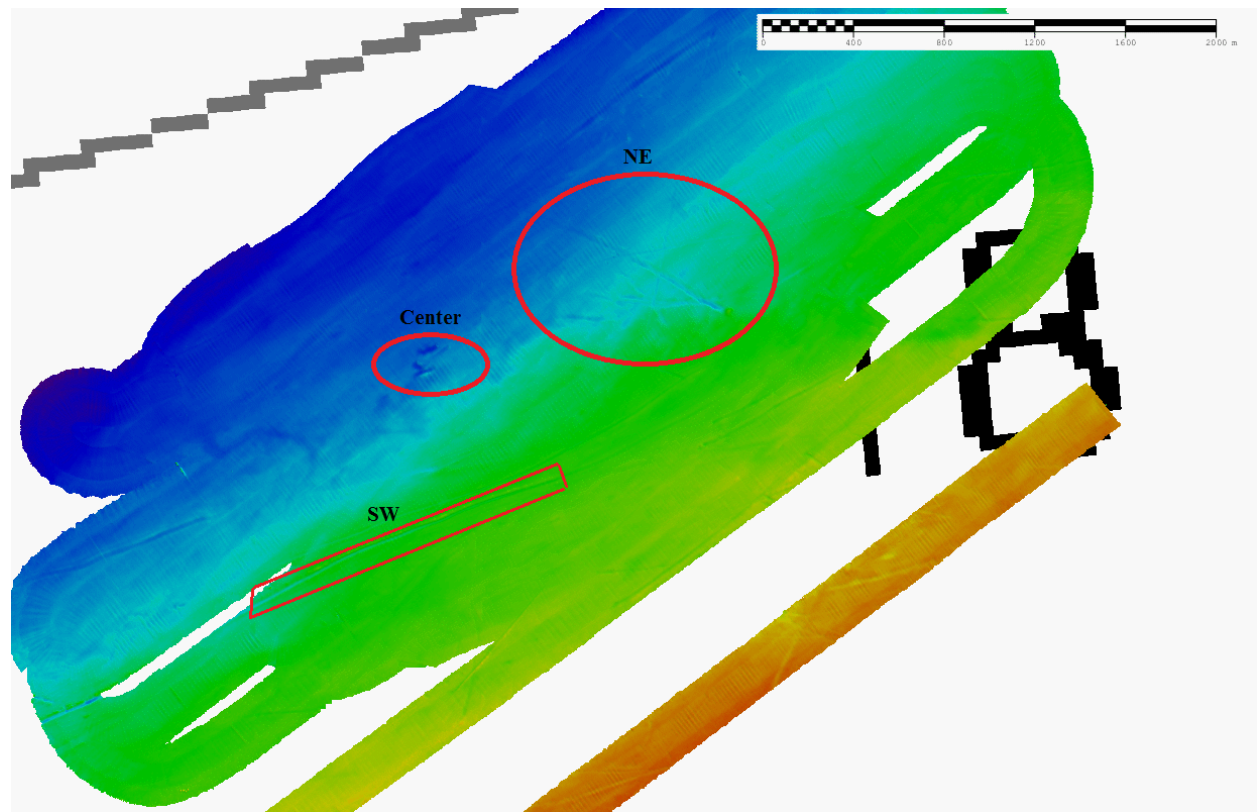
No ferry routes or terminals exist for this survey.

**D.2.7 Platforms**

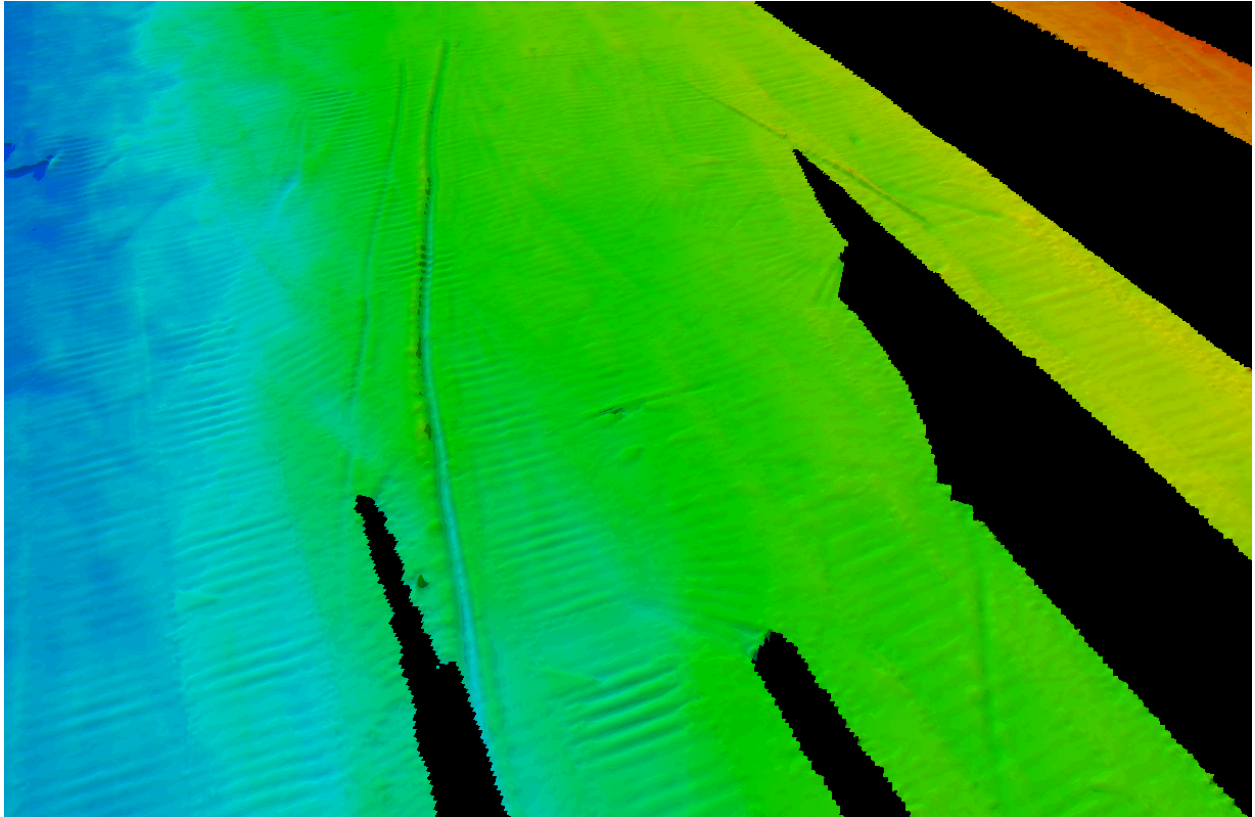
No platforms exist for this survey.

**D.2.8 Significant Features**

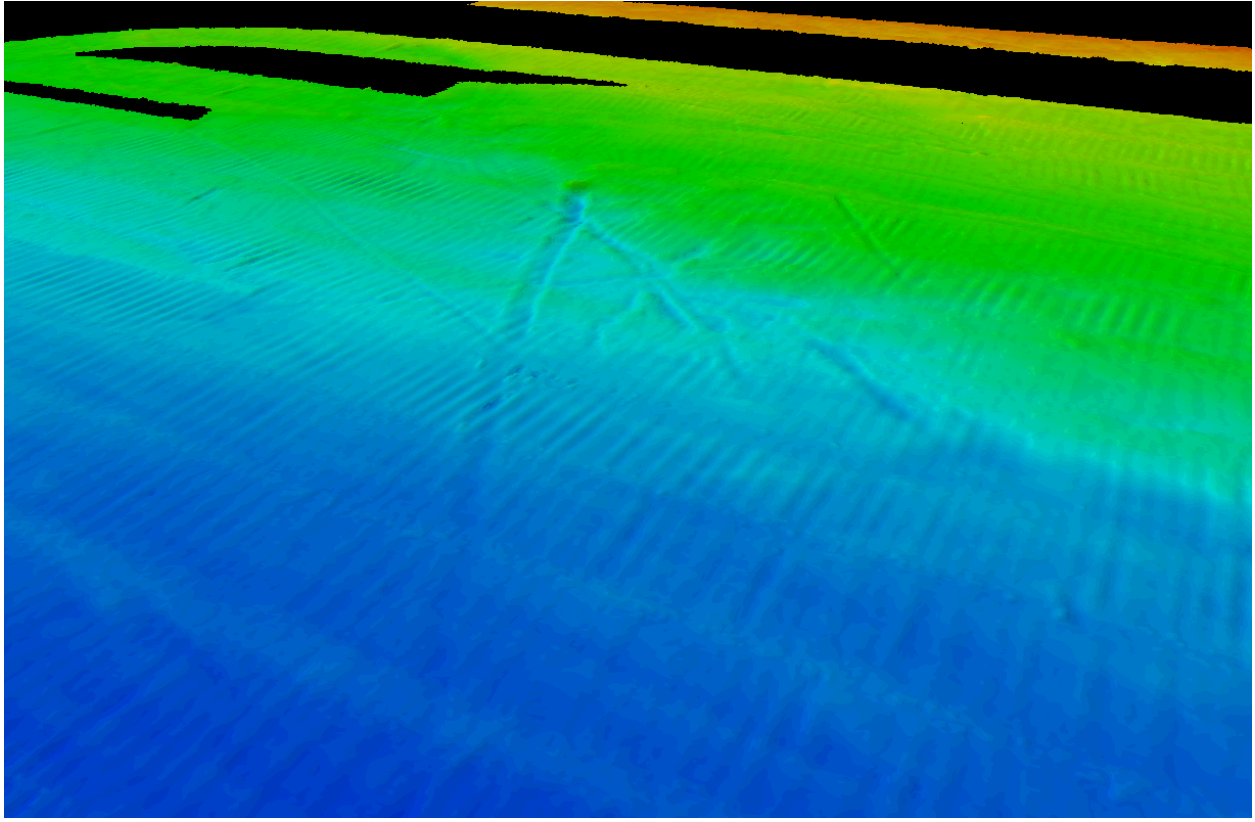
The purpose of survey F00617 was object detection of potential historic shipwrecks. It was found that the seafloor in the survey area had multiple areas of ice gouging which also appears to have produced mounds along the side of the gouge or at the end. In most areas the mounds were no greater than 2 meters above or below the actual seafloor.



*Figure 11: Seafloor ice gouging overview*



*Figure 12: SW seafloor ice gouging and small mount*



*Figure 13: NE seafloor ice gouging*

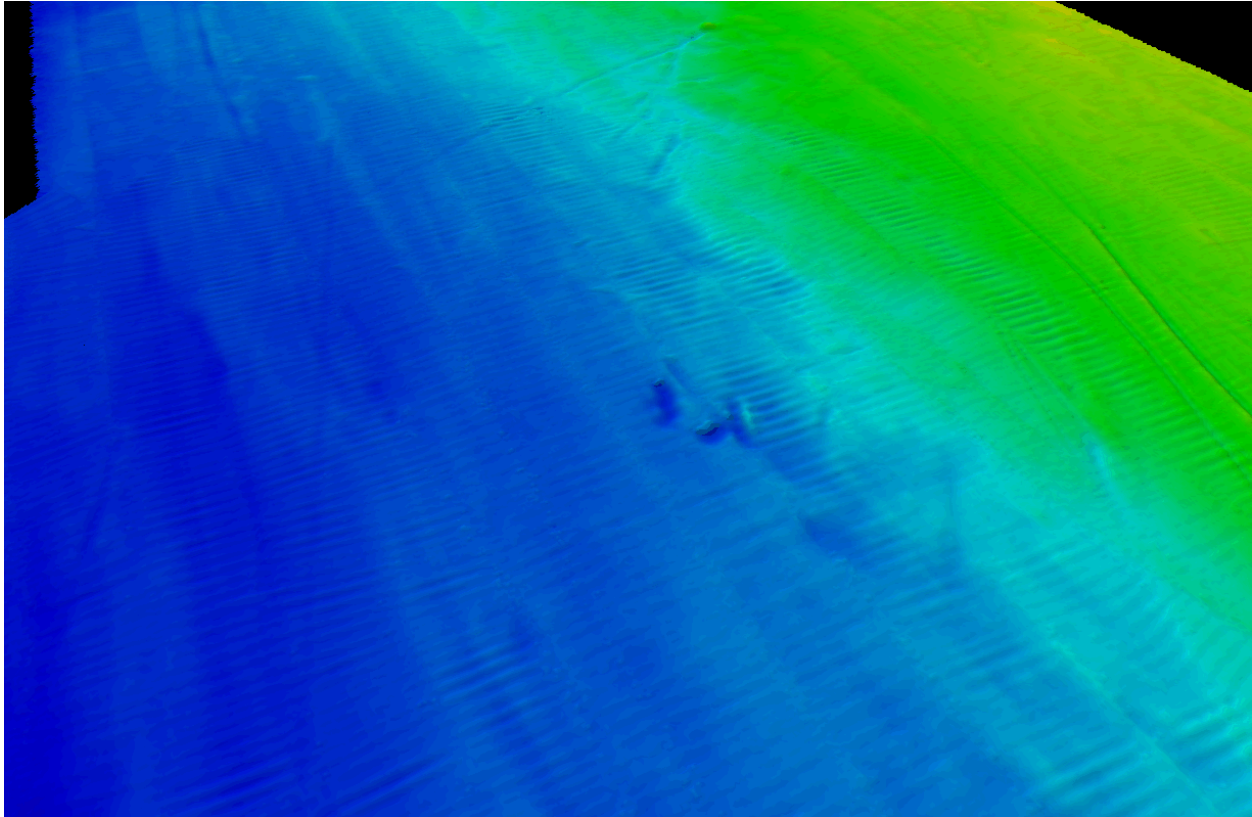


Figure 14: Center seafloor ice gouging

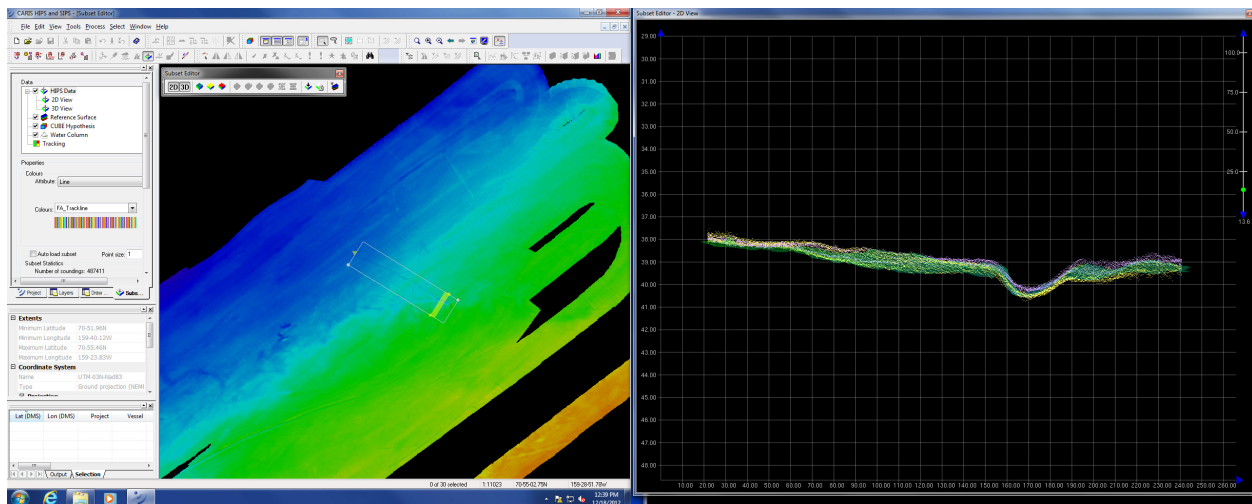


Figure 15: Center of survey area ice gouge

## D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits.

**D.2.10 New Survey Recommendations**

These survey areas are known to have multiple historic shipwrecks which may be partially intact; as well as human artifacts associated with these shipwrecks. It is recommended that all survey areas and sheets listed in the project instructions be surveyed as per the coverage requirements listed in the Project Instructions. It is further recommended that for future investigation multiple methods of object detection be utilized including sidescan sonar, sub-bottom profilers and magnetometers.

**D.2.11 New Inset Recommendations**

No new insets are recommended for this area.


## E. Approval Sheet

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey was conducted in agreement with practices outlined in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data and serve the intended purpose. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2012-12-05
Coast Pilot Report	2012-12-14

Approver Name	Approver Title	Approval Date	Signature
CDR James M. Crocker, NOAA	Chief of Party	01/18/2013	 <small>CDR James M Crocker, NOAA            cn=CDR James M Crocker, NOAA,            o=NOAA Ship Fairweather,            ou=Commanding Officer,            email=james.m.crocker@noaa.gov, c=US            2013.01.18 09:08:28 -08'00'</small>
LT Caryn M. Zacharias, NOAA	Field Operations Officer	01/18/2013	 <small>Caryn M. Zacharias            2013.01.17 23:54:18            -08'00'</small>
LT Timothy M. Smith, NOAA	Field Operations Officer	01/18/2013	<b>Tim Smith</b> <small>Digitally signed by Tim Smith            DN: cn=Tim Smith, o=NOAA, ou=NOAA            Ship Fairweather,            email=timothy.m.smith@noaa.gov, c=US            Date: 2013.01.18 08:17:50 -08'00'</small>
CST Tami M. Beduhn	Chief Survey Technician	01/18/2013	<small>Tami Beduhn            '00'08- 11:25:55 2013.01.13</small> 
HAST Janelle L. Harrison	Sheet Manager	01/18/2013	 <small>Janelle Harrison            2013.01.18 07:38:37 -08'00'</small>

## F. Table of Acronyms

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



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

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



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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** September 07, 2012

**HYDROGRAPHIC BRANCH:** Pacific  
**HYDROGRAPHIC PROJECT:** S-S928-FA-2012  
**HYDROGRAPHIC SHEET:** F00617

**LOCALITY:** Vicinity of Point Belcher, Arctic Ocean, AK  
**TIME PERIOD:** August 10, 2012

**TIDE STATION USED:** 949-7645 Prudhoe Bay, AK  
Lat. 70° 24.0'N Long. 148° 31.6' W

**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 0.181 meters

**REMARKS: RECOMMENDED ZONING**  
Use zone(s) identified as: CS95 & CS105

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).

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ou=PKI, ou=OTHER,  
cn=HOVIS.GERALD.THOMAS.1365860250  
Date: 2012.09.13 16:58:14 -04'00'

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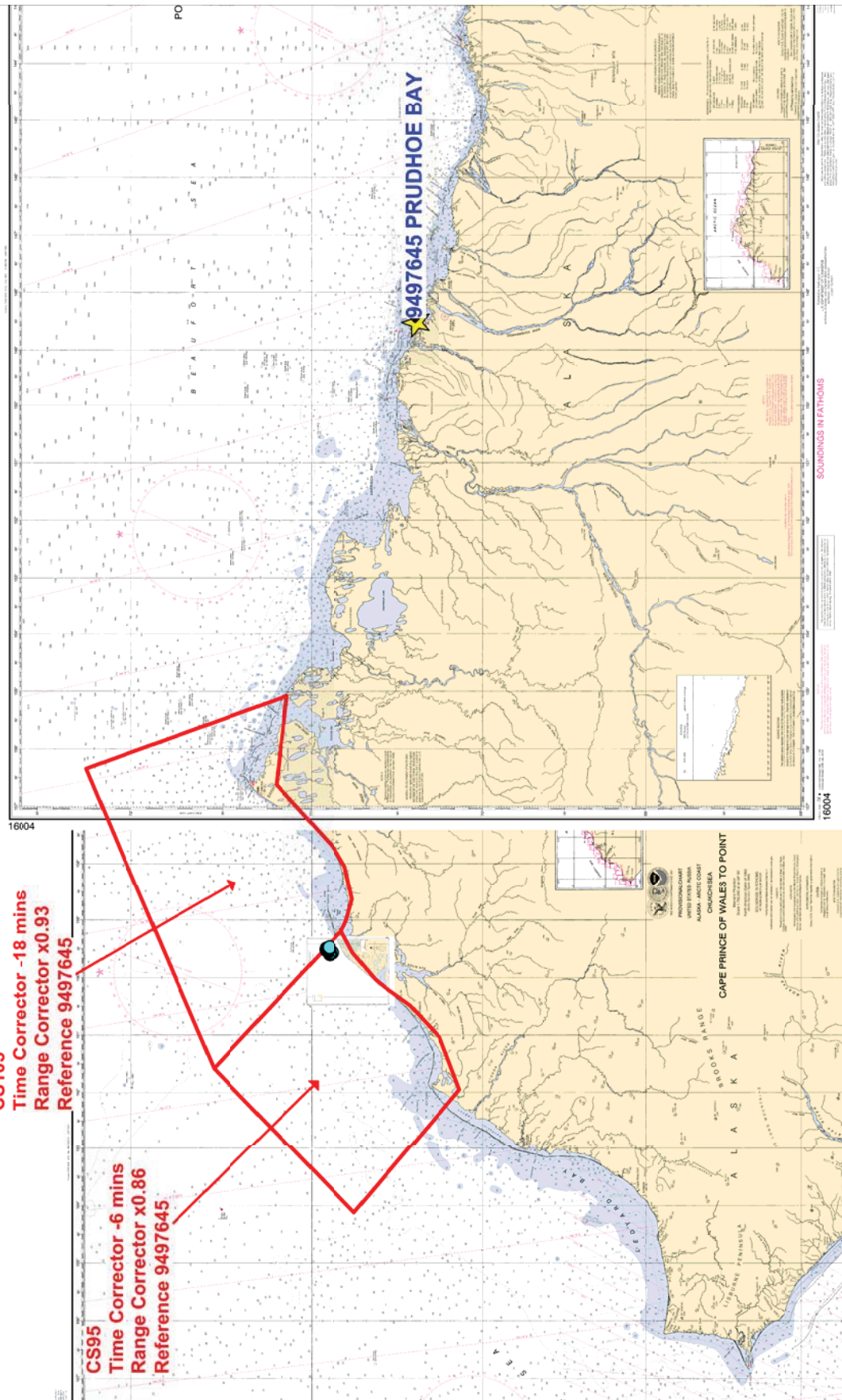
CHIEF, PRODUCTS AND SERVICES BRANCH



# Final Tidal Zoning for S-S928-FA-2012, F00617 Vicinity of Point Belcher, Arctic Ocean, AK

**CS105**  
Time Corrector -18 mins  
Range Corrector x0.93  
Reference 9497645

**CS95**  
Time Corrector -6 mins  
Range Corrector x0.86  
Reference 9497645



APPROVAL PAGE

**F00617**

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

- F00617\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00617\_GeoImage.pdf

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

Approved: \_\_\_\_\_

**Peter Holmberg**

**Cartographic Team Lead, Pacific Hydrographic Branch**

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

Approved: \_\_\_\_\_

**LCDR Benjamin K. Evans, NOAA**

**Chief, Pacific Hydrographic Branch**