D00168

NOAA Form 76-35A

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

DESCRIPTIVE REPORT

Type of Survey: Reconnaissance

Registry Number: D00168

LOCALITY

State: Alaska

General Locality: Arctic Ocean

Sub-locality: Bering Strait to Canadian Border

2012

CHIEF OF PARTY
CDR James M. Crocker,
NOAA

LIBRARY & ARCHIVES

Date:

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET		**D00168**

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:	**Alaska**
General Locality:	**Arctic Ocean**
Sub-Locality:	**Bering Strait to Canadian Border**
Scale:	1: **40,000**
Dates of Survey:	**8/5/2012 to 8/23/2012**
Instructions Dated:	**7/11/2012**
Project Number:	**M-S974-FA-12**
Field Unit:	**NOAA Ship *Fairweather***
Chief of Party:	**CDR James M. Crocker**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	
Verification by:	**Pacific Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**
H-Cell Compilation Units:	***meters at Mean Lower Low Water***

Remarks:

Horizontal Coordinate System: UTM Zones 3, 4, 5 and 6. The purpose of this survey is to provide contemporary survey to update National Ocean Service (NOS) charts. All separates are filed with the hydrographic data. Revisions and 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 D00168

Project: M-S974-FA-12

Locality: Arctic Ocean

Sublocality: Bering Strait to Canadian Border

Scale: 1:40000

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 Artic Ocean, within the sub-locality of Bering Strait to Canadian Border.

A.1 Survey Limits

Data was acquired within the following survey limits:

Northeast Limit	Southwest Limit
72.33 N 138.21 W	65.1 N 173.24 W

Table 1: Survey Limits

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

The purpose of this survey is to acquire data during Fairweather's transit from Bering Strait to the Canadian Border and back, crossing recent transit data for verification.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

All track line survey surfaces meet IHO order 2. For more details see section B 3.3 IHO Uncertainty.

Due to the uncertainties and flier associated with this survey it was deemed by the Pacific Hydrographic Branch that the data collected for D00168 is partially adequate to supersede the previous data. The data

shall be applied to the chart where the depths are shoaler than charted. D00168 will not disprove charted soundings because the data coverage of this survey. In addition, every sounding chosen for charting will be examined to ensure that it is valid and is not a flier.

A.4 Survey Coverage

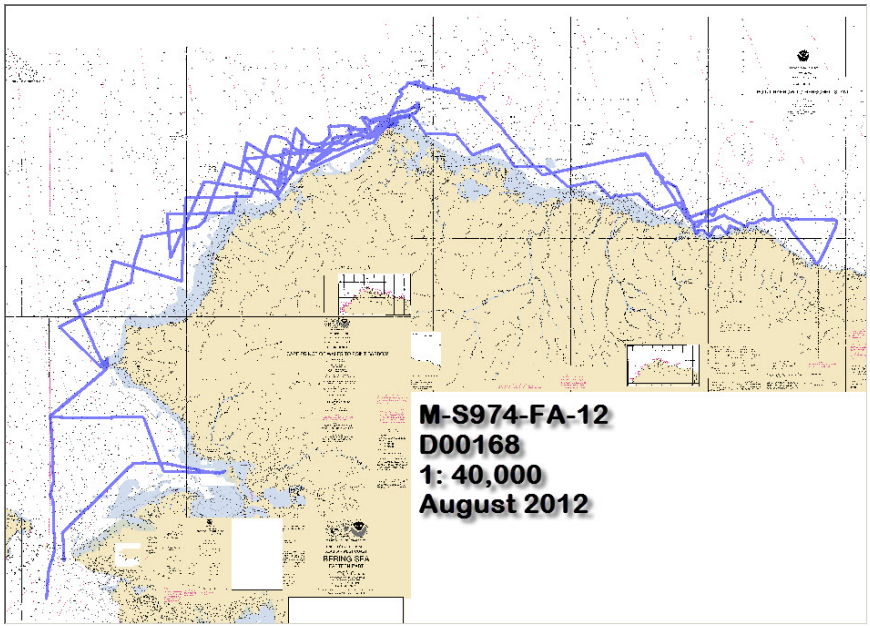


Figure 1: D00168 Coverage.

There is no Coverage type Specified. There is no inshore limit defined for this survey. Survey in assigned transit corridor, crossing from side to side so as to intersect with recent transit data. Return transit will cross corridor in an intersecting manner so as to create an "argyle" pattern.

A.5 Survey Statistics

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

	HULL ID	***2808***	***s220***	***2805***	***Total***
LNM	**SBES Mainscheme**	0.00	0.00	0.00	0.00
	MBES Mainscheme	134.54	3255.38	234.63	3624.55
	Lidar Mainscheme	0.00	0.00	0.00	0.00
	SSS Mainscheme	0.00	0.00	0.00	0.00
	SBES/MBES Combo Mainscheme	0.00	0.00	0.00	0.00
	SBES/SSS Combo Mainscheme	0.00	0.00	0.00	0.00
	MBES/SSS Combo Mainscheme	0.00	0.00	0.00	0.00
	SBES/MBES Combo Crosslines	0.00	0.00	0.00	0.00
	Lidar Crosslines	0.00	0.00	0.00	0.00
Number of Bottom Samples					0
Number of DPs					0
Number of Items Items Investigated by Dive Ops					0
Total Number of SNM					476.8

Table 2: Hydrographic Survey Statistics

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

Survey Dates
08/05/2012
08/06/2012
08/07/2012
08/08/2012
08/09/2012
08/10/2012
08/11/2012
08/12/2012
08/13/2012
08/14/2012
08/15/2012
08/16/2012
08/17/2012
08/18/2012
08/19/2012
08/20/2012
08/21/2012
08/22/2012
08/23/2012
08/24/2012

Table 3: Dates of Hydrography

A.6 Shoreline

There is no Shoreline Verification requirement for this project.

A.7 Bottom Samples

The ship stopped at assigned stations to conduct CTD transects and bottom samples to support the Distributed Biological Observatory (DBO) and Alaska State Department of Conservation's AKMAP projects.

Sea ice coverage west of Barrow and in the Beaufort Sea was not favorable for the ship's planned operations requiring the ship to work along the ice edge making several attempts to reach assigned stations that were covered by heavy concentrations of sea ice.

The ship was able to complete all of the southern stations and only 50% of the stations west of Barrow, for a total of 10 bottom samples. Bottom samples were collected by the visiting scientist and the data were not recorded for charting.

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. Due to the nature of this survey being a trackline survey data gaps caused by blow outs and depths beyond the systems specifications where not re-run.

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:

Hull ID	***S220***	***2805***	***2808***
LOA	70.4 meters	8.64 meters	8.64 meters
Draft	4.7 meters	1.12 meters	1.12 meters

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
RESON	7111	MBES
RESON	8160	MBES
RESON	7125	MBES
Applanix	POS/MV V4	Positioning and Attitude System
Brooke Ocean	MVP 200	Sound Speed System
RESON	SVP70	Sound Speed System
RESON	SVP71	Sound Speed System
Sea Bird	SBE 19plus	Conductivity, Temperature and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Surface differencing in CARIS Bathy Data Base was used to assess agreement between transit North and South tracklines. The Figures depict a difference surface between a 32-meter surface made with a trackline during the transit north only and 32-meter surface made with a trackline during the transit south only. This difference surface is submitted digitally in the Separates II folder. The two surfaces agree within plus or minus 2 meters, therefore the areas where the tracklines cross each other agree within the total allowable vertical and horizontal uncertainty in their common areas.

It was found that some crossline comparison partially failed the statistical computation. The graphs show deviation values (m) equal to +/- 1.$. This is due to the lack of data point in the exported file. The data is within specifications after a visual review. See figure 9, 17, 19 and 21 for graphical representation.

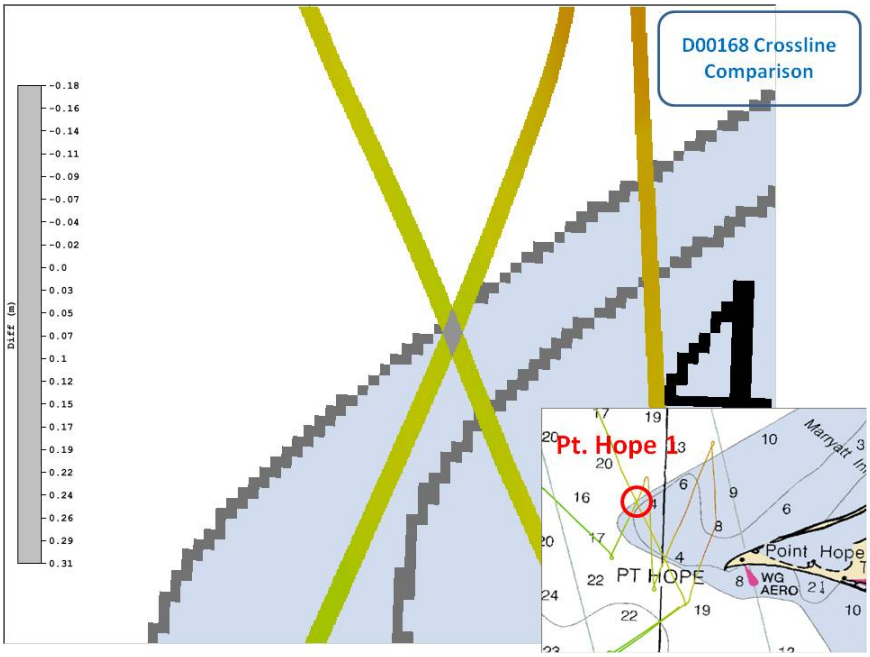


Figure 2: D00168 Crossline Comparison. Pt. Hope.

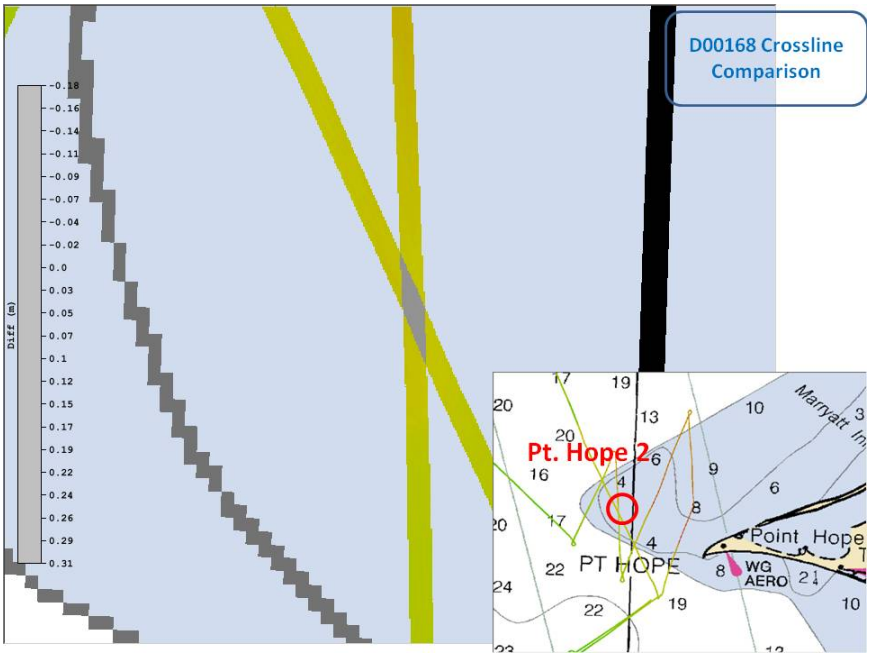


Figure 3: D00168 Crossline Comparison. Pt. Hope.

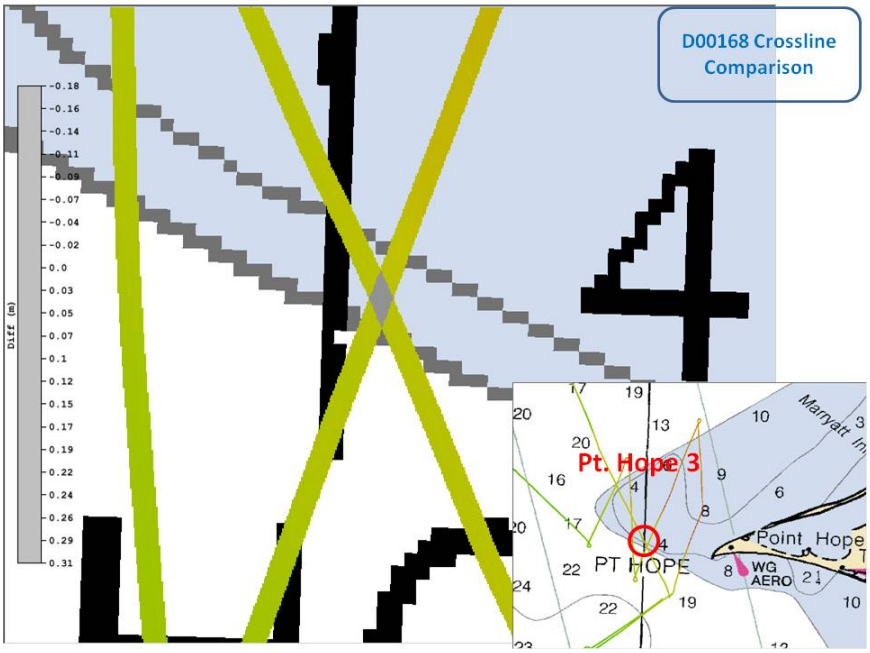
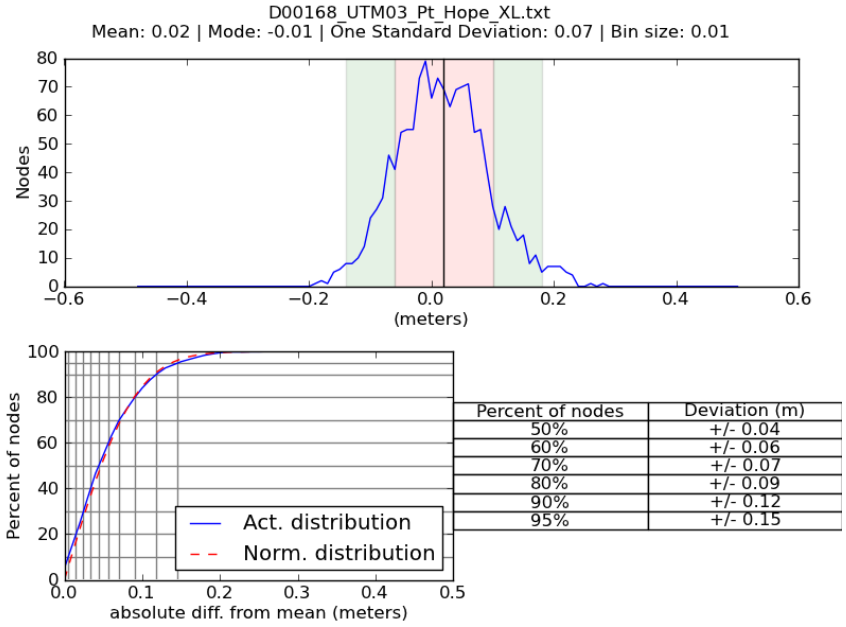


Figure 4: D00168 Crossline Comparison. Pt. Hope.



Percent of nodes	Deviation (m)
50%	+/- 0.04
60%	+/- 0.06
70%	+/- 0.07
80%	+/- 0.09
90%	+/- 0.12
95%	+/- 0.15

Figure 5: Statistical information for differences between tracklines.

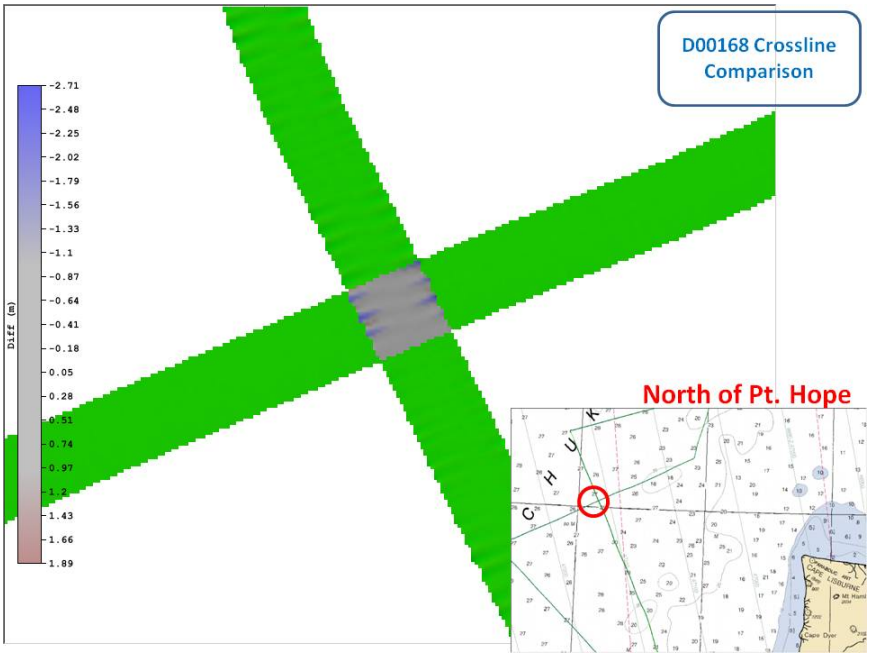
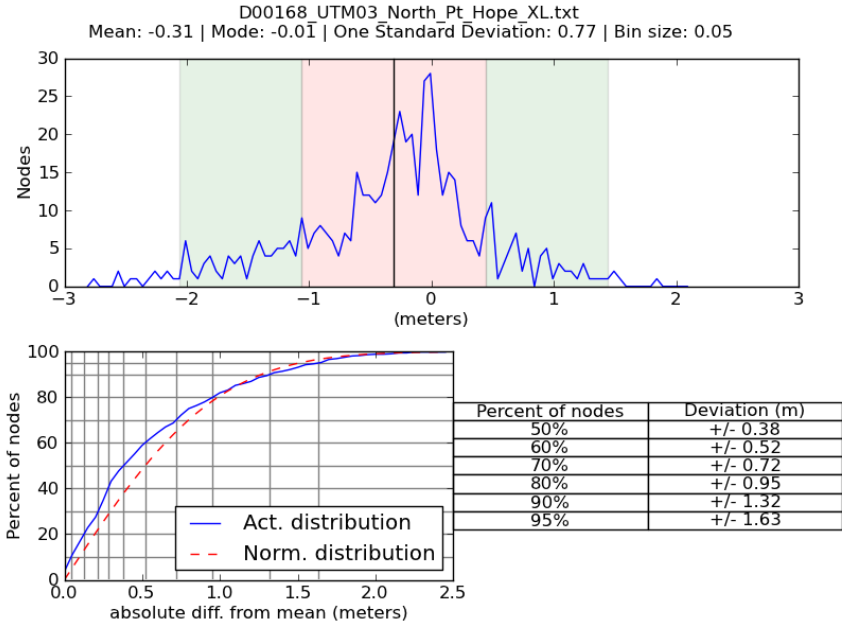


Figure 6: D00168 Crossline Comparison. North of Pt. Hope.



Percent of nodes	Deviation (m)
50%	+/- 0.38
60%	+/- 0.52
70%	+/- 0.72
80%	+/- 0.95
90%	+/- 1.32
95%	+/- 1.63

Figure 7: Statistical information for differences between tracklines.

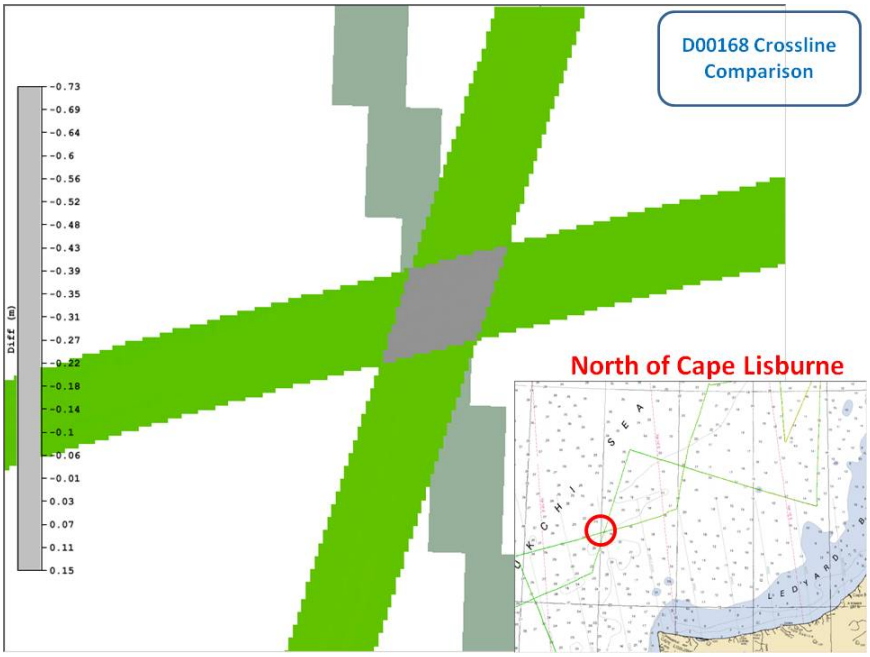
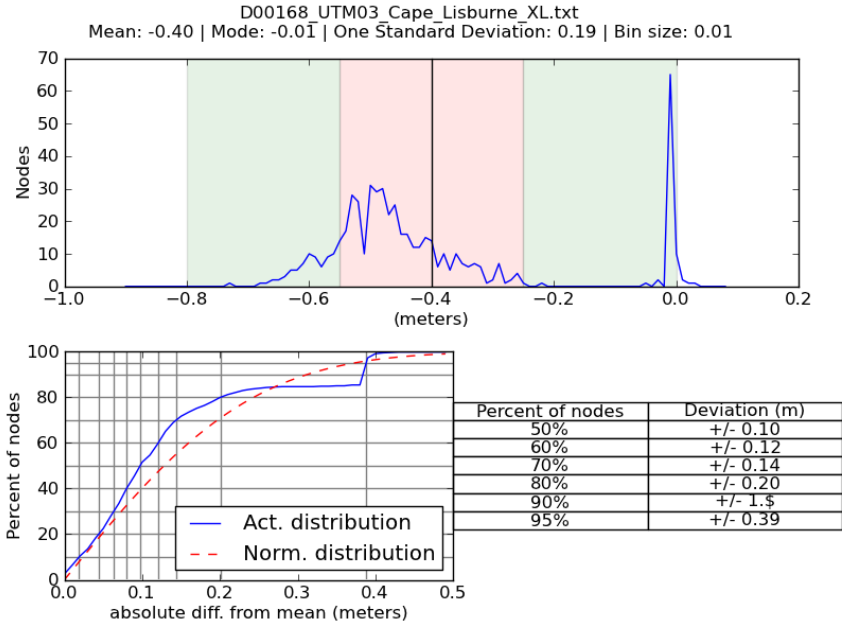


Figure 8: D00168 North Cape Lisburne.



Percent of nodes	Deviation (m)
50%	+/- 0.10
60%	+/- 0.12
70%	+/- 0.14
80%	+/- 0.20
90%	+/- 1.$
95%	+/- 0.39

Figure 9: Statistical information for differences between tracklines.

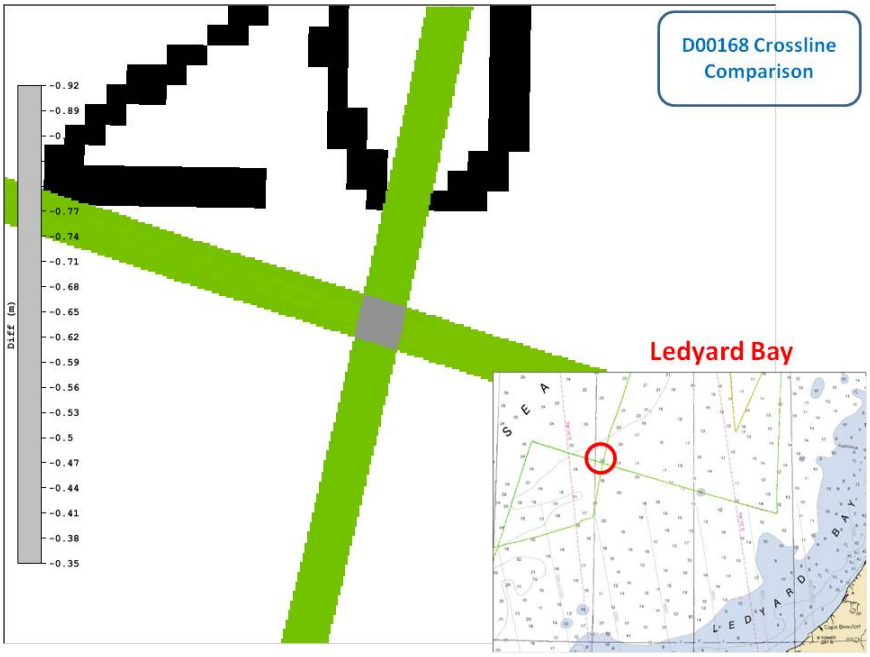
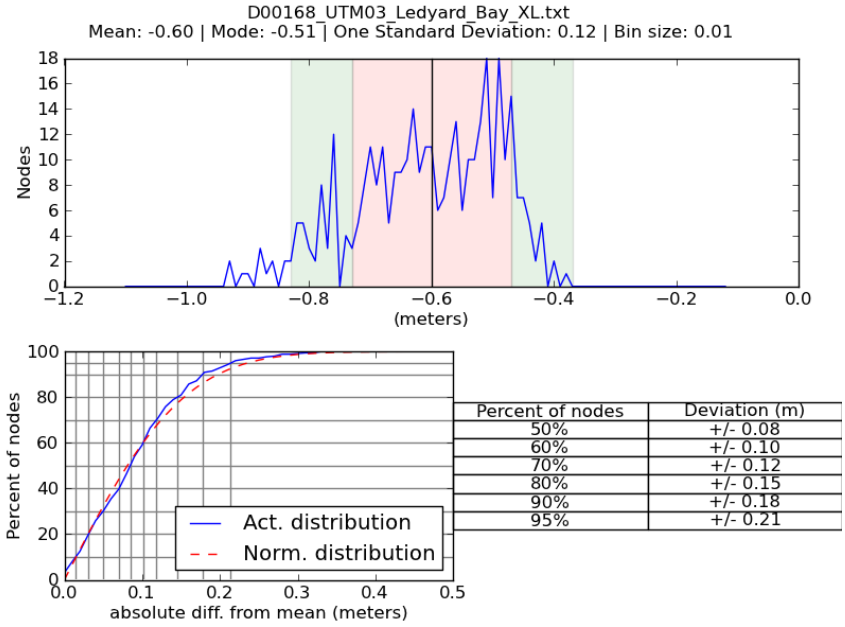


Figure 10: D00168 Ledyard Bay.



Percent of nodes	Deviation (m)
50%	+/- 0.08
60%	+/- 0.10
70%	+/- 0.12
80%	+/- 0.15
90%	+/- 0.18
95%	+/- 0.21

Figure 11: Statistical information for differences between tracklines.

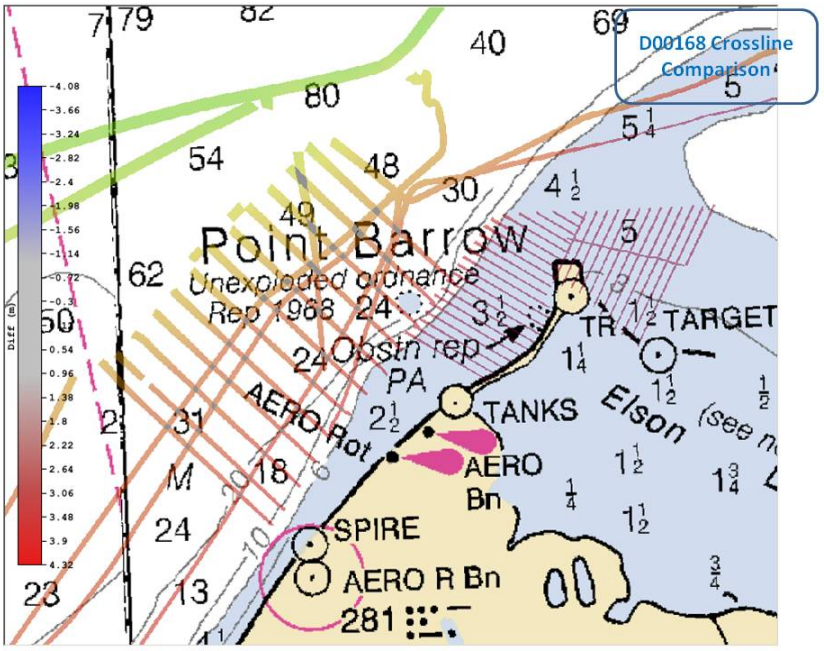


Figure 12: D00168 Point Barrow.

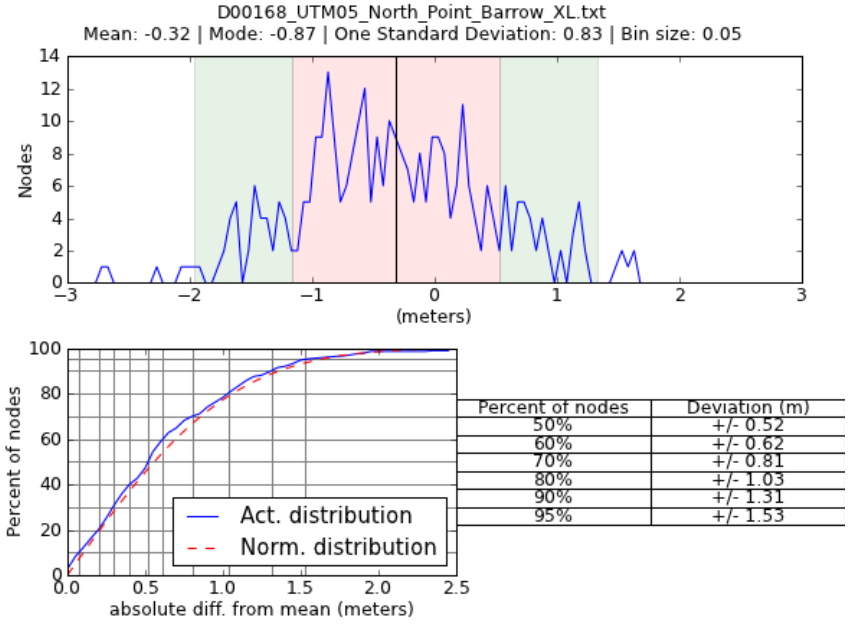


Figure 13: Statistical information for differences between tracklines.

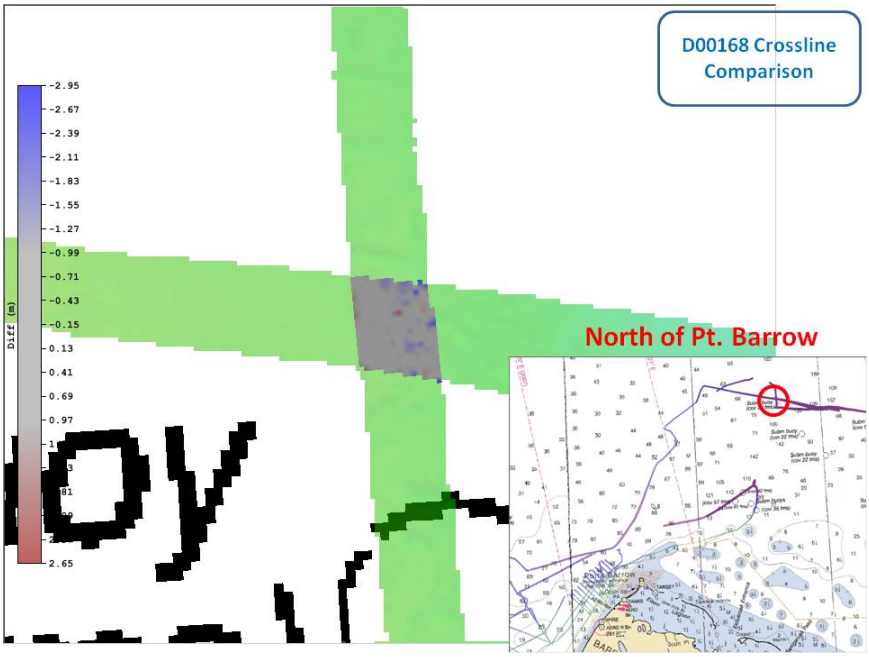
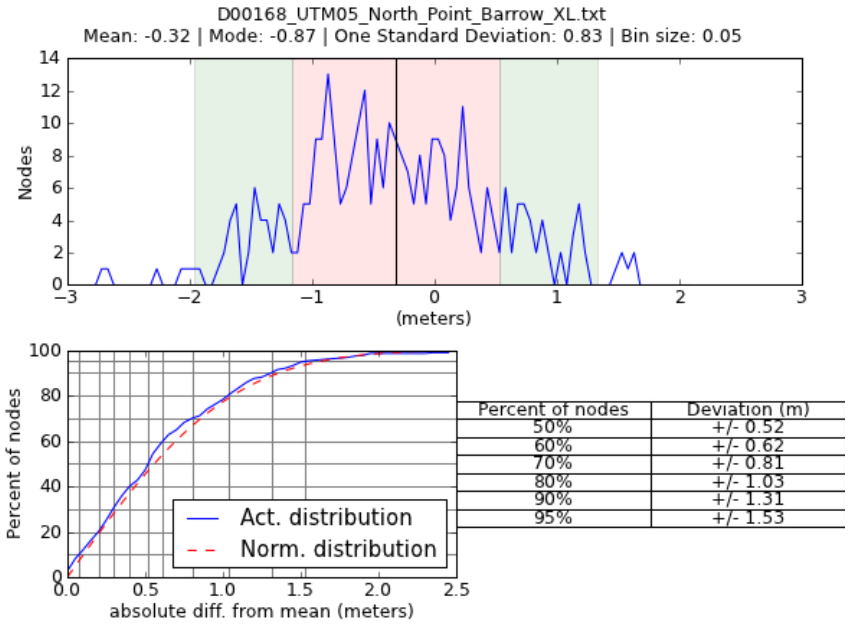


Figure 14: D00168 North Pt Barrow.



Percent of nodes	Deviation (m)
50%	+/- 0.52
60%	+/- 0.62
70%	+/- 0.81
80%	+/- 1.03
90%	+/- 1.31
95%	+/- 1.53

Figure 15: Statistical information for differences between tracklines.

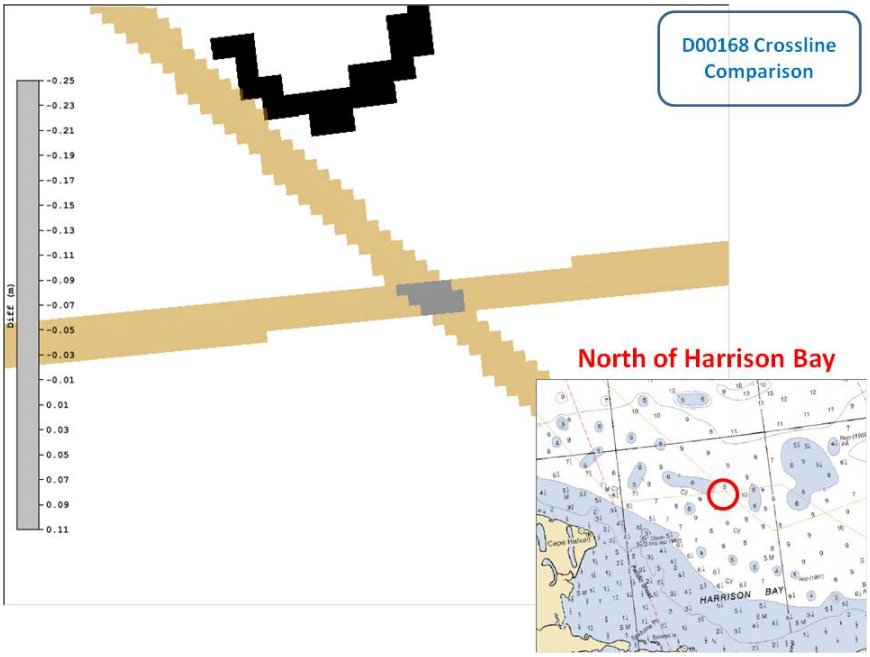
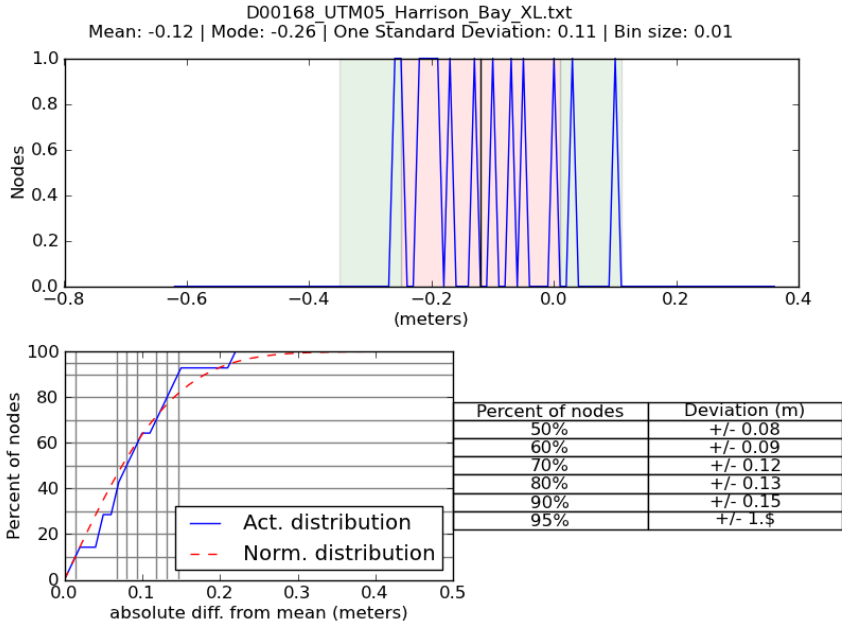


Figure 16: D00168 North Harrison Bay.



Percent of nodes	Deviation (m)
50%	+/- 0.08
60%	+/- 0.09
70%	+/- 0.12
80%	+/- 0.13
90%	+/- 0.15
95%	+/- 1.$

Figure 17: Statistical information for differences between tracklines.

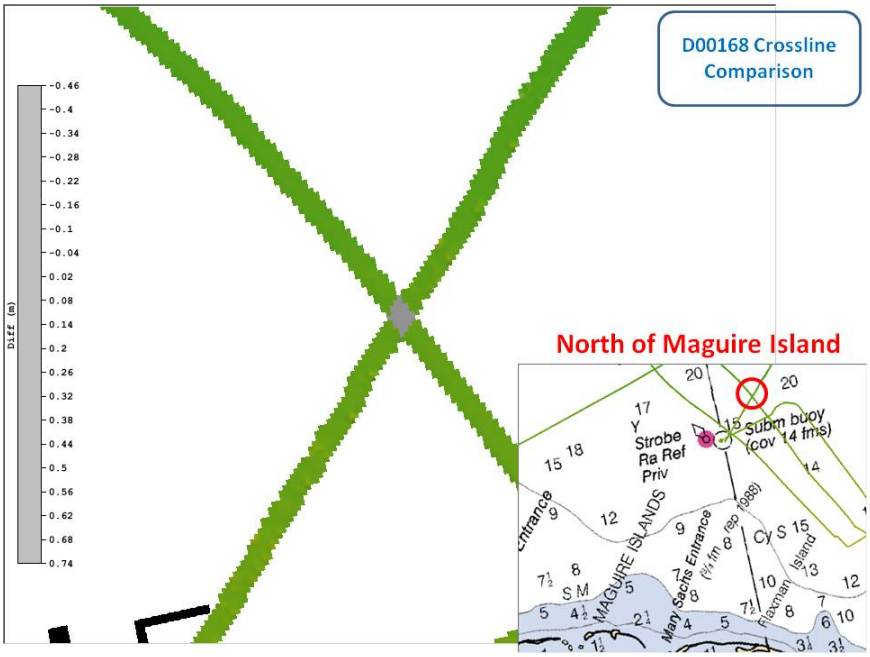
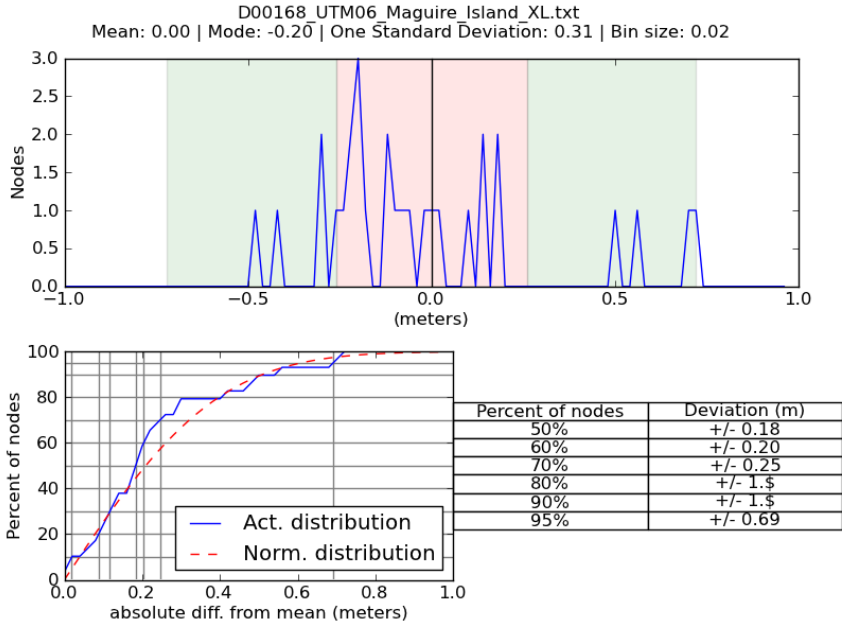


Figure 18: D00168 North Maguire Island.



Percent of nodes	Deviation (m)
50%	+/- 0.18
60%	+/- 0.20
70%	+/- 0.25
80%	+/- 1.$
90%	+/- 1.$
95%	+/- 0.69

Figure 19: Statistical information for differences between tracklines.

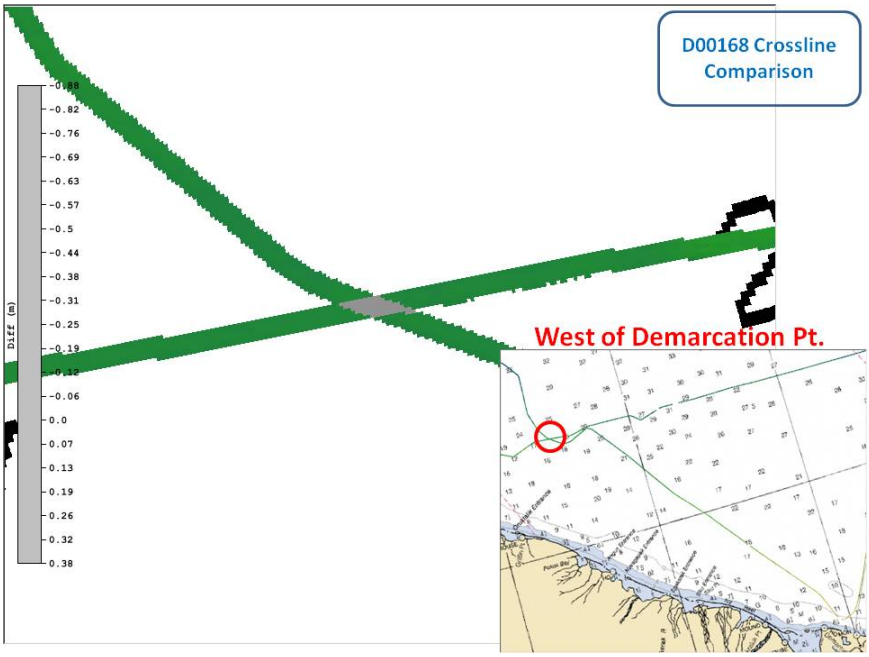
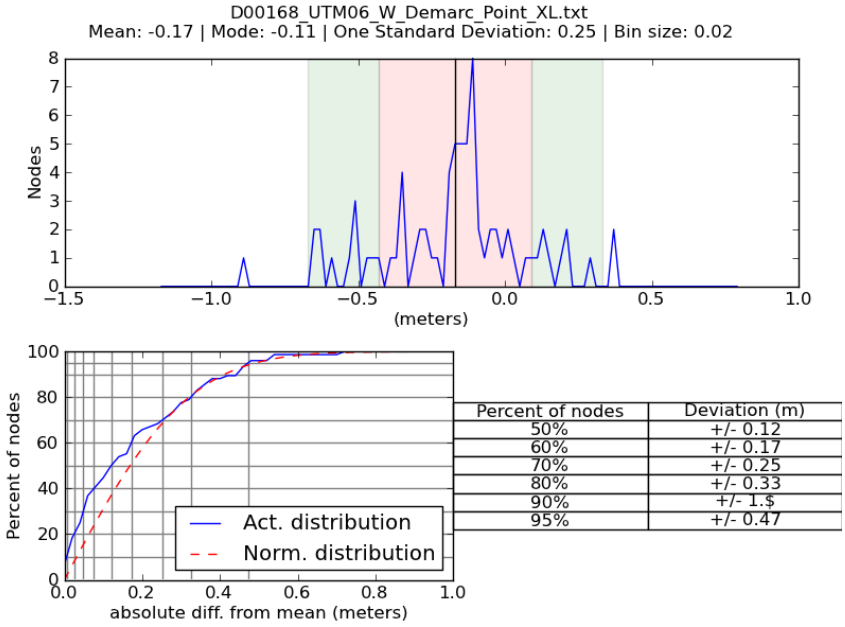


Figure 20: D00168 West Demarcation Pt.



Percent of nodes	Deviation (m)
50%	+/- 0.12
60%	+/- 0.17
70%	+/- 0.25
80%	+/- 0.33
90%	+/- 1.$
95%	+/- 0.47

Figure 21: Statistical information for differences between tracklines.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.01meters	0.1785meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
220	0.5meters/second	0.5meters/second	0.5meters/second
2805	4meters/second		0.5meters/second
2808	4meters/second		0.5meters/second

Table 7: Survey Specific Sound Speed TPU Values

B.2.3 Junctions

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

B.2.5.1Hypack timing error

A time offset was observed between the computer clock and the time shown in Hypack coming from the Applanix POS/MV. This anomaly was observed in the transit south in conjunction with significant swell. All settings in Hypack were verified with no problems.

In CARIS HIPS to compensate such time offset, a time correction value was added to the 7111 HVCF file on DN234, DN235, DN236, and DN237. The time correction ranged from -5 to -6 seconds. The time offset was variable throughout the trackline survey. The time correction was the best fit for the actual condition. See figures 22, 23 and 24 for graphical representation.

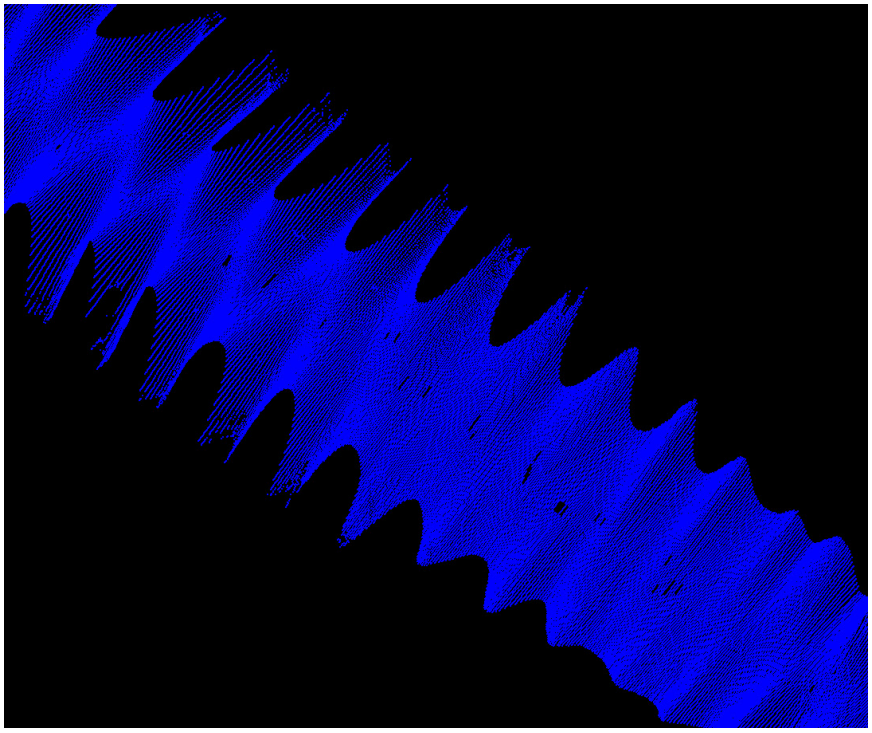


Figure 22: D00168 Hypack timing error.

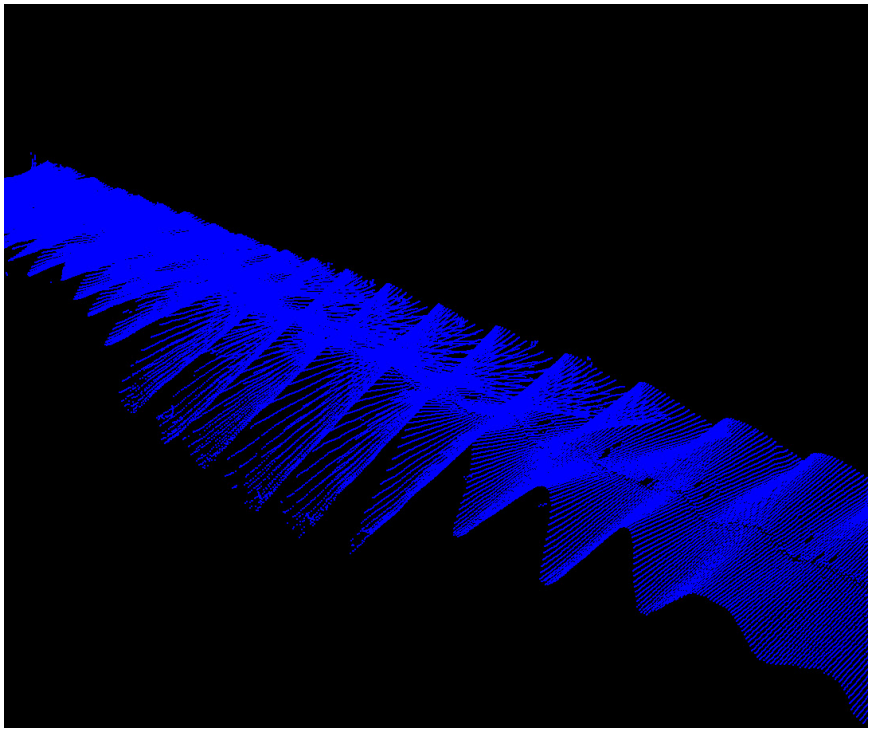
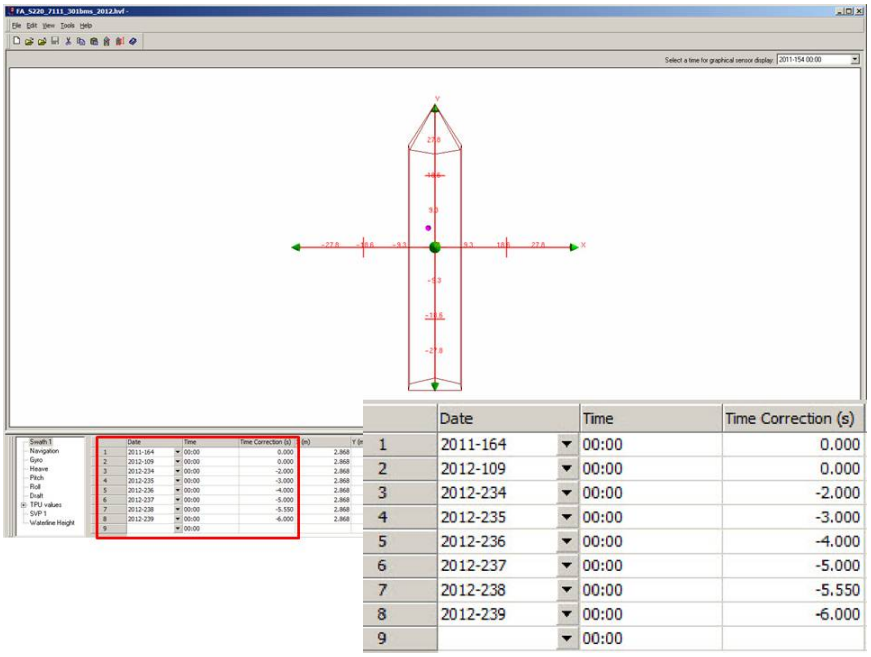


Figure 23: D00168 Hypack timing error.



	Date	Time	Time Correction (s)
1	2011-164	00:00	0.000
2	2012-109	00:00	0.000
3	2012-234	00:00	-2.000
4	2012-235	00:00	-3.000
5	2012-236	00:00	-4.000
6	2012-237	00:00	-5.000
7	2012-238	00:00	-5.550
8	2012-239	00:00	-6.000
9		00:00	

Figure 24: Vessel file time correction.

B.2.5.1Hypack data gap

During acquisition, bathymetric data was continuously logged over midnight. As a result, there were multiple data gaps throughout the project. It was noticed, during data processing, that those lines logged over midnight will have a gap (no bathy) within the first minute or so, after crossing the UTC midnight mark. See figure 25 for graphical representation. In other cases, a short line was automatically created. Such lines were taken out of the data set.

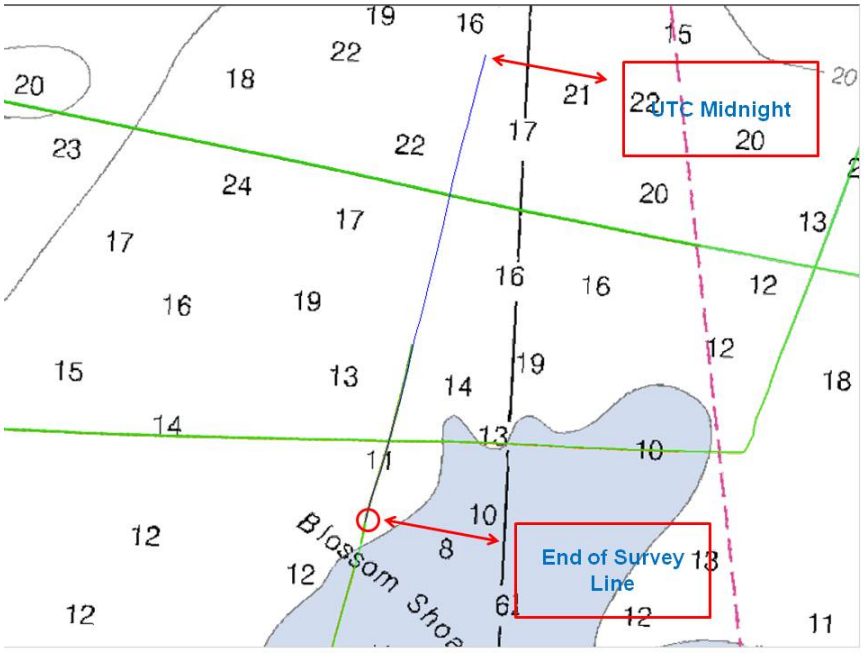


Figure 25: UTC midnight data gap.

B.2.6 Factors Affecting Soundings

B.2.6.1 Surface Sound Speed Sensor

Due to the rough sea surface conditions in the project area, S220 experienced hard pitching when surveying into seas and swell. As a result, brief periods of apparent extreme refraction, or profile bending, occurred throughout D00168 when air or bubbles flowed down the hull causing erroneous measurements in the Surface Sound Velocimeter. An example of the erroneous measurements in Surface Sound Speed and the bent profiles can be found at 65.45N, 168.99W and can be seen in Figures 26. The spikes in Surface Sound Speed caused by pounding were removed and the gaps were interpolated across.

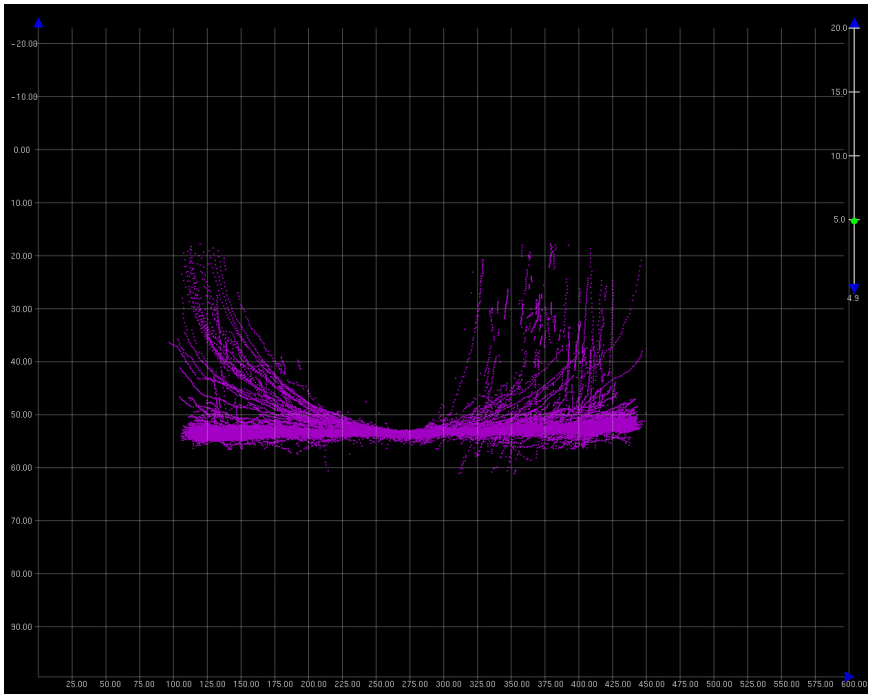


Figure 26: Surface Sound Speed Sensor issues.

B.2.6.1 Large Swell

During acquisition on D00168 multiple weather events occurred during the track line survey in the Bering Sea and Chukchi Sea causing large swell conditions in the working area. All MBES data for D00168 were collected in three to nine-foot sea surface swells. Due to the swell, significant pitching with a peak magnitude of 8 to 10 degrees was experienced. In many cases, the pitching caused the Reson 8160 to entirely lose bottom tracking, see Figure 27. While the Reson 7111 did not lose bottom tracking entirely the outer beams appeared to be of unreliable quality as compared with adjacent data. The data were cleaned out where they affected the surfaces.

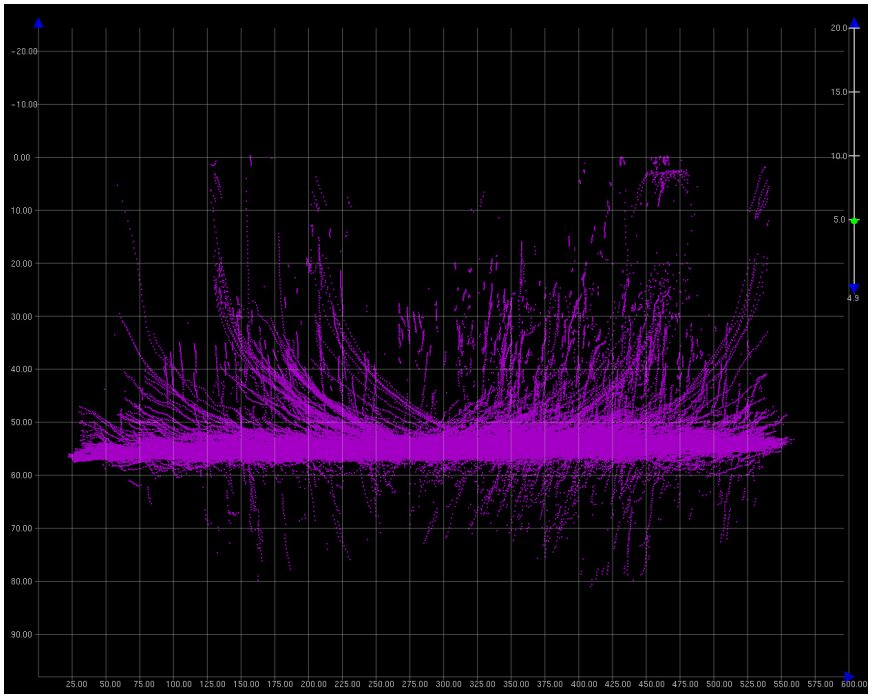


Figure 27: Large Swell.

In addition the reviewer at PHB found that a line run in the Bering Sea exhibited severe roll errors which may have been attributed to the sea state. This data was not applied to the chart.

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.

Stationary casts were performed using a Seabird SBE19 Plus CTD sensor as specified for the Distributed Biological Observatory (DBO).

For MVP deployment, the cast frequency was set to 15 to 30 minutes to compensate for the sound speed variances in the area. Sound speed cast intervals were reduced when surveying in these variable areas to capture a representative sample of the changing water properties. See figure 28 for graphical representation.

During the transit South the MVP fish was recovered on DN236 from 1915 to 2115 UTC, to avoid large pieces of ice at sea surface.

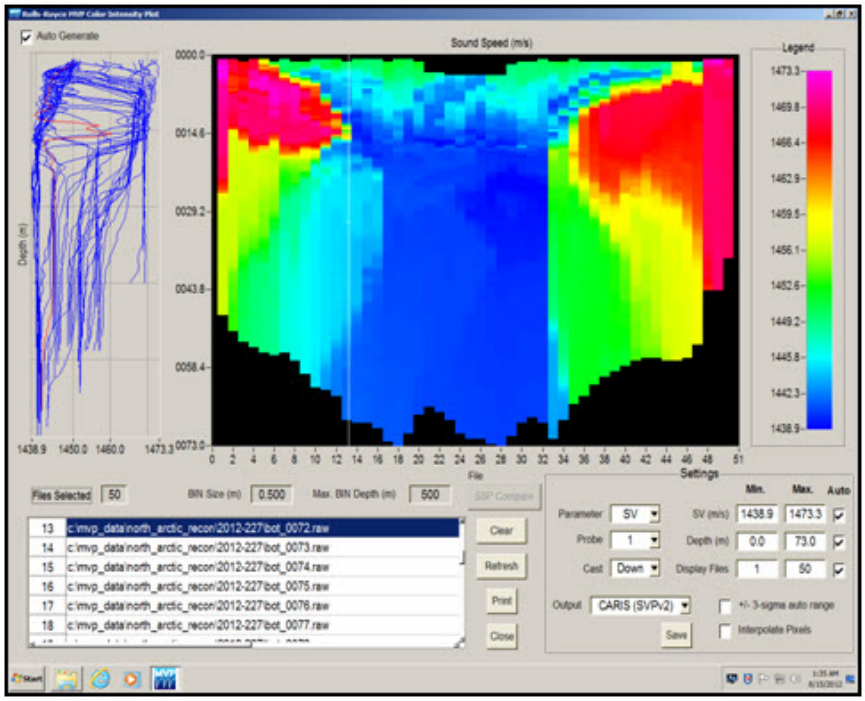


Figure 28: Sound Speed Variability.

B.2.8 Coverage Equipment and Methods

Acquisition and processing methods deviated from the DAPR, due to the nature of the trackline survey. Therefore, accuracy standards were not met as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) for all lines within the UTM02 and UTM03 field sheets. For additional information see below.

B.2.9 IHO Uncertainty UTM02

Due to the nature of the trackline survey, in addition to weather conditions, accuracy standards were not met as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) dated April 2012. It was found that 94.96% of nodes in the finalized 4-meter meet IHO Order 1 for all depths of survey D00168 UTM 02, see Standards Compliance Review in Appendix V. To assess vertical accuracy standards, a child layer titled “IHO1” was created for each of the 2- meter, 4-meter, using the equation as stated in section C. 2.1 of the DAPR.

B.2.10 IHO Uncertainty UTM 03

Due to the nature of the trackline survey, in addition to weather conditions, accuracy standards were not met as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) dated April 2012. It was found that 100% of nodes in the finalized 4-meter grid meet or exceed IHO Order 1 specifications,

see Standards Compliance Review in Appendix V. To assess vertical accuracy standards, a child layer titled "IHO1" was created for each of the 1-meter, 2- meter and 4-meter finalized surfaces, using the equation as stated in section C. 2.1 of the DAPR.

B.2.11 IHO Uncertainty UTM04

The data meet the accuracy specifications as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) dated April 2012. It was found that 100% of nodes in the finalized 8-meter grid meet or exceed IHO Order 1 specifications, 100% meet the IHO Order 2 for all depths of survey D00168 UTM 04, see Standards Compliance Review in Appendix V. To assess vertical accuracy standards, a child layer titled "IHO1" was created for each of the 1- meter, 2- meter, 4-meter, and 8-meter finalized surfaces and "IHO2" child layer for each of the 8-meter, 16-meter and 32-meter finalized surfaces, using the equation as stated in section C. 2.1 of the DAPR.

B.2.12 IHO Uncertainty UTM05

The data meet the accuracy specifications as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) dated April 2012. It was found that 100 % of nodes in the finalized 8-meter grid meet or exceed IHO Order 1 specifications,100% meet the IHO Order 2 for all depths of survey D00168 UTM 05, see Standards Compliance Review in Appendix V. To assess vertical accuracy standards, a child layer titled "IHO1" was created for each of the 1- meter, 2- meter, 4-meter, and 8-meter finalized surfaces and "IHO2" child layer for each of the 8-meter, 16-meter and 32-meter finalized surfaces, using the equation as stated in section C. 2.1 of the DAPR.

B.2.13 IHO Uncertainty UTM06

The data meet the accuracy specifications as stated in the NOS Hydrographic Surveys specifications and Deliverables (HSSD) dated April 2012. It was found that 100% of nodes in the finalized 8-meter grid meet or exceed IHO Order 1 specifications, 100% meet the IHO Order 2 for all depths of survey D00168 UTM 06, see Standards Compliance Review in Appendix V. To assess vertical accuracy standards, a child layer titled "IHO1" was created for each of the 1- meter, 2- meter, 4-meter, and 8-meter finalized surfaces and "IHO2" child layer for each of the 8-meter, 16-meter and 32-meter finalized surfaces, using the equation as stated in section C. 2.1 of the DAPR.

B.2.14 Density UTM02

Due to the nature of the trackline survey, in addition to weather conditions, density requirements for D00168 UTM 02 were not achieved with only 48.97% of finalized surface nodes containing five or more soundings; see Standards Compliance Review in Appendix V.

B.2.15 Density UTM03

Due to the nature of the trackline survey, density requirements for D00168 UTM 03 were not achieved with only 84.45% of finalized surface nodes containing five or more soundings; see Standards Compliance Review in Appendix V.

B.2.16 Density UTM04

Due to the nature of the trackline survey, density requirements for D00168 UTM 04 were not achieved with only 94.14% of finalized surface nodes containing five or more soundings; see Standards Compliance Review in Appendix V.

B.2.17 Density UTM05

Due to the nature of the trackline survey, density requirements for D00168 UTM 05 were not achieved with only 92.40% of finalized surface nodes containing five or more soundings; see Standards Compliance Review in Appendix V.

B.2.18 Density UTM06

Due to the nature of the trackline survey, density requirements for D00168 UTM 06 were not achieved with only 94.61% of finalized surface nodes containing five or more soundings; see Standards Compliance Review in Appendix V.

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 in 7k files and submitted directly to NGDC to be archived and to PHB where the data will be processed if requested.

Due to the nature of this survey, the Pacific Hydrographic Branch did not produce backscatter mosaics for this survey.

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: NOAA Extended Attribute Files V5_2.

B.5.2 Surfaces

The following CARIS surfaces were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
D00168_UTM02_2m	CUBE	2 meters	-	NOAA_2m	MBES Recon
D00168_UTM02_4m	CUBE	4 meters	-	NOAA_4m	MBES Recon
D00168_UTM03_1m	CUBE	1 meters	-	NOAA_1m	MBES Recon
D00168_UTM03_2m	CUBE	2 meters	-	NOAA_2m	MBES Recon
D00168_UTM03_4m	CUBE	4 meters	-	NOAA_4m	MBES Recon
D00168_UTM04_1m	CUBE	1 meters	-	NOAA_1m	MBES Recon
D00168_UTM04_2m	CUBE	2 meters	-	NOAA_2m	MBES Recon
D00168_UTM04_4m	CUBE	4 meters	-	NOAA_4m	MBES Recon
D00168_UTM04_8m	CUBE	8 meters	-	NOAA_8m	MBES Recon
D00168_UTM04_16m	CUBE	16 meters	-	NOAA_16m	MBES Recon
D00168_UTM04_32m	CUBE	32 meters	-	NOAA_32m	MBES Recon
D00168_UTM05_1m	CUBE	1 meters	-	NOAA_1m	MBES Recon
D00168_UTM05_2m	CUBE	2 meters	-	NOAA_2m	MBES Recon
D00168_UTM05_4m	CUBE	4 meters	-	NOAA_4m	MBES Recon
D00168_UTM05_8m	CUBE	8 meters	-	NOAA_8m	MBES Recon
D00168_UTM05_16m	CUBE	16 meters	-	NOAA_16m	MBES Recon
D00168_UTM05_32m	CUBE	32 meters	-	NOAA_32m	MBES Recon
D00168_UTM06_1m	CUBE	1 meters	-	NOAA_1m	MBES Recon
D00168_UTM06_2m	CUBE	2 meters	-	NOAA_2m	MBES Recon
D00168_UTM06_4m	CUBE	4 meters	-	NOAA_4m	MBES Recon

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, sixteen, and thirty-two meters. The NOAA CUBE parameters mandated in HSSD were used for the creation of all CUBE BASE surfaces in Survey D00168.

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 sea floor. Where these spurious soundings cause the gridded surface to be shoaler than the reliably measured seabed by greater than the maximum allowable vertical uncertainty at that depth, the noisy data have been rejected and the surface recomputed.

Fliers do exist in this survey that exceed IHO standards. Every sounding which was chosen for cartographic compilation were examined to ensure that the depth was valid and within IHO specifications.

B.5.3 Data Logs

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final tide and sound velocity application is noted in the D00168 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Critical Sounding

Due to the smooth nature of the survey area no designated soundings were required.

B.5.5 Data Processing Deviations

Both the RESON 8160 and 7111 data were collect for this project. However, only the RESON 7111 data has been analyzed to supersede the charted depths 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.

Reson 7111 data were filtered to 60 and 15 degrees off nadir on both Port and starboard to remove poor quality data.

C. Vertical and Horizontal Control

No HVCR was submitted for this survey. All information related to Horizontal and Vertical Control for this project will be stated in the current section.

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, AK	949-7645
Red Dog Dock, AK	949-1094

Table 9: NWLON Tide Stations

File Name	Status
9491094.tid	Final Approved
9497645.tid	Final Approved

Table 10: Water Level Files (.tid)

File Name	Status
D00168CORF.zdf	Final

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

A request for final approved tides was sent to N/OPS1 on 09/07/2012. The final tide note was received on 10/10/2012.

C.2 Horizontal Control

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

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 for real-time positioning of the ship for this project, which afford the option of using Satellite- Based Augmentation Systems (SBAS) - such as WAAS - for real-time decimeter level accuracy in position data.

During this project there were minimal DGPS data gaps while using the Integrated DGPS causing almost no data quality issues. An adequate satellite constellation was maintained throughout the project. The average number of GAMS SVs visible was between 6-12 satellites.

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	LNM Date	NM Date
16005	1:700000	10	10/2007	11/01/2012	11/01/2012

Table 12: Largest Scale Raster Charts

16005

Soundings from survey D00168 generally agreed within one to two fathoms with charted depths on chart 16005. Notable exceptions to this general agreement are listed and shown in the figures below.

20.5 NM NE of Cape Dezhneva: many disagreements between surveyed soundings and charted depths. Example includes a 18 fathom chart depth that was surveyed with MBES at 30 fathoms. See figure 29, for graphical representation.

30.7 NM SSW of Ice Cape: many disagreements between surveyed soundings and charted depths. Example includes a 10 fathom chart depth that was surveyed with MBES at 15 fathoms. See figure 30, for graphical representation.

30.2 NM NW of Seahorse Islands: many disagreements between surveyed soundings and charted depths. Example includes a 46 fathom chart depth that was surveyed with MBES at 36 fathoms. See figure 31, for graphical representation.

23.7 NM North of Seahorse Islands: many disagreements between surveyed soundings and charted depths. Example includes a 28 fathom chart depth that was surveyed with MBES at 45 fathoms. See figure 32, for graphical representation.

20.5 NM North of Point Barrow: many disagreements between surveyed soundings and charted depths. Example includes a 37 fathom chart depth that was surveyed with MBES at 53 fathoms. See figure 33, for graphical representation.

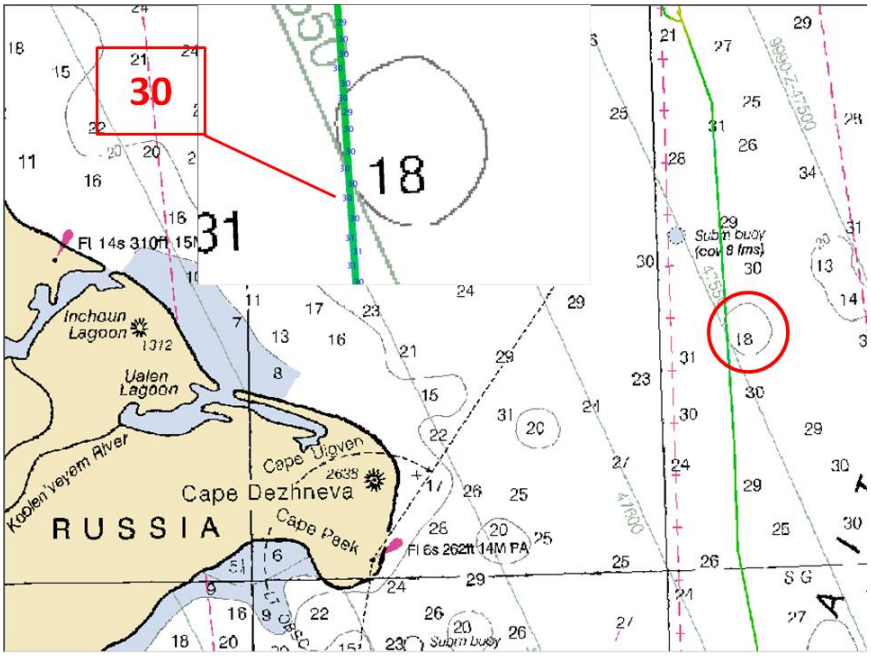


Figure 29: Disagreement between charted depths (16005) and surveyed soundings 20.5 NM NE of Cape Dezhneva. Geographical Position:66/14.58N, 168/51.96W.

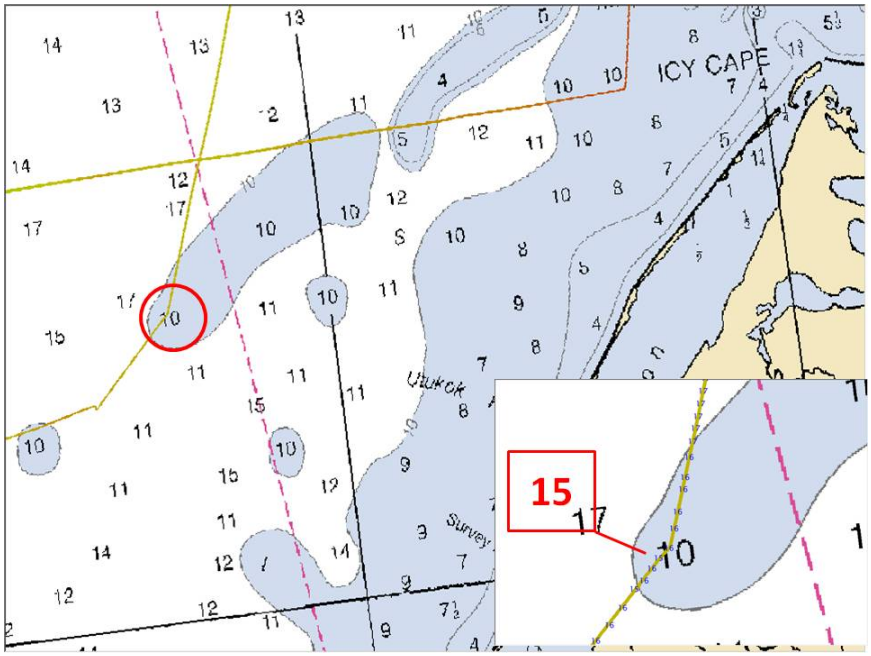


Figure 30: Disagreement between charted depths (16005) and surveyed soundings 30.7 NM SSW of Ice Cape. Geographical Position: 70/12.88N, 163/21.4W.

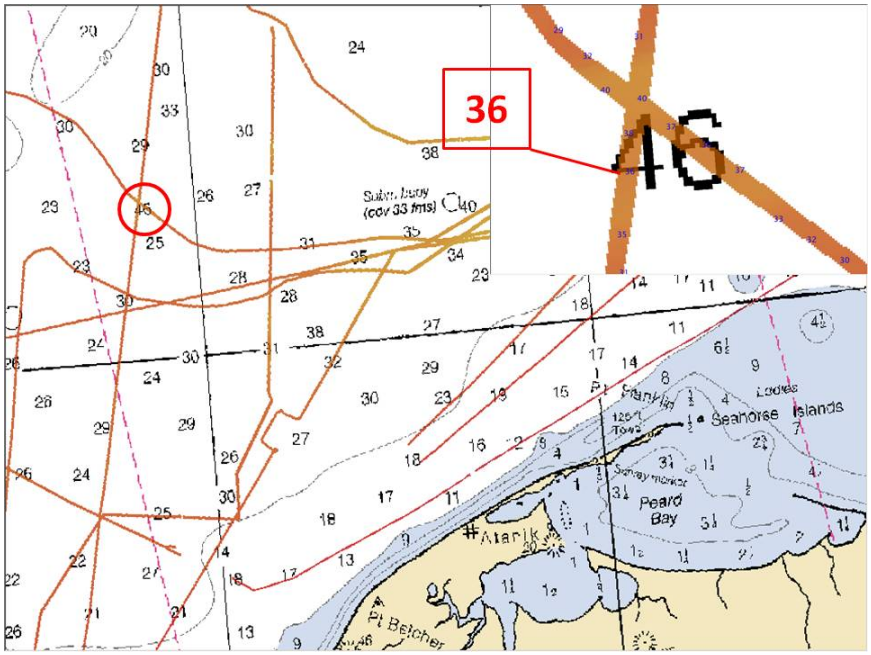


Figure 31: Disagreement between charted depths (16005) and surveyed soundings 30.2 NM NW of Seahorse Islands. Geographical Position: 70/07.57, 160/08.65W.

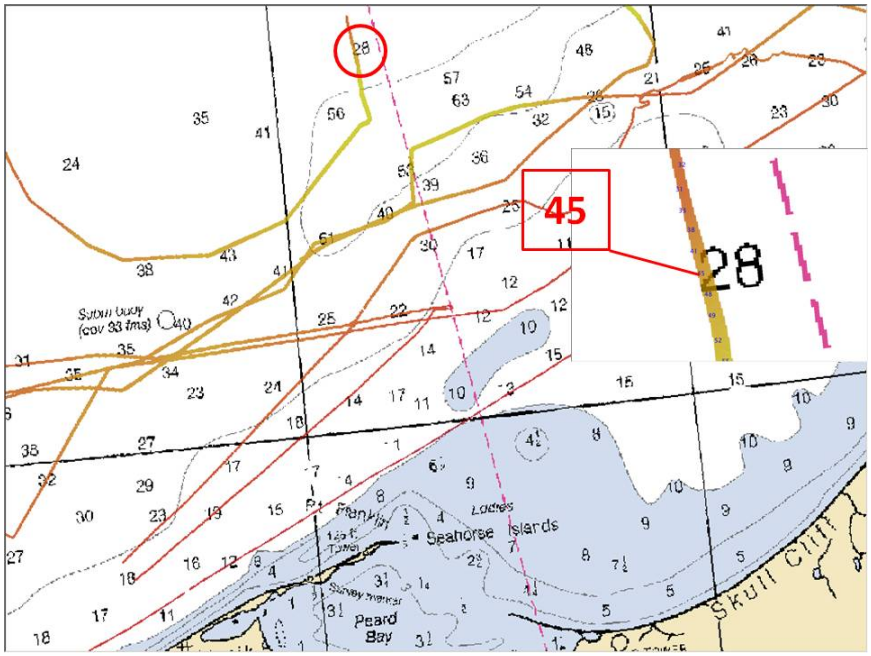


Figure 32: Disagreement between charted depths (16005) and surveyed soundings 23.7 NM North of Seahorse Islands. Geographical Position: 71/18.27, 158/47.07W.

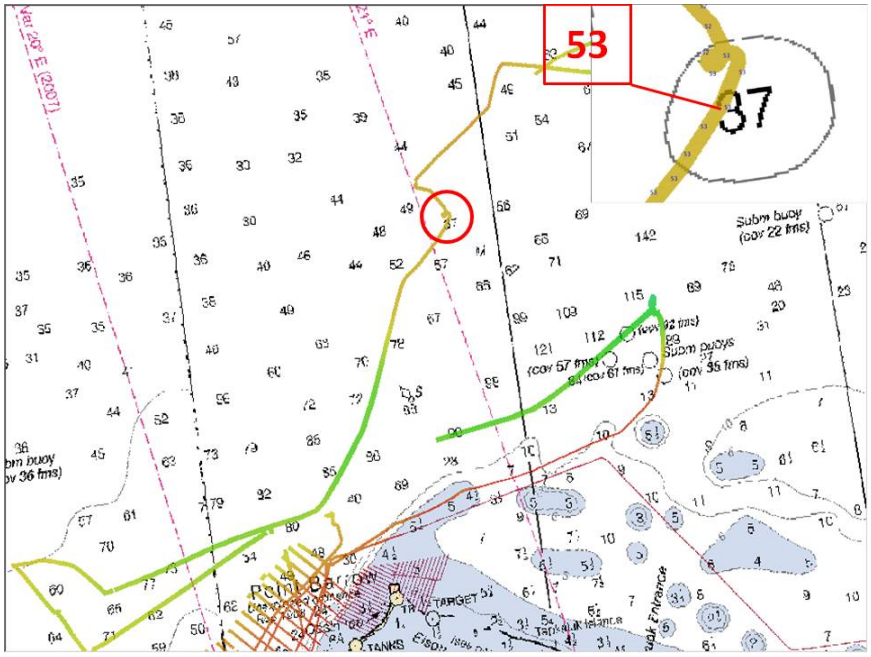


Figure 33: Disagreement between charted depths (16005) and surveyed soundings 20.5 NM North of Point Barrow. Geographical Position: 71/44.39N 156/09.78W.

D.1.2 AWOIS Items

No AWOIS items exist for this survey.

D.1.3 Charted Features

Charted features exist for this survey, but were not investigated.

D.1.4 Uncharted Features

No uncharted features exist for this survey.

D.1.5 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.6 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.7 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.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) exist for this survey, but were not investigated.

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

No significant features exist for this survey.

D.2 Construction and Dredging

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

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 data meets or exceeds requirements as set forth 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 in their common areas. 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	01/09/2013	 James M Crocker cn=James M Crocker, o=NOAA Ship Fairweather, ou, email=james.m.crocker@noaa.gov, c=US 2013.03.13 10:48:08 -07'00'
LT Caryn M. Zacharias, NOAA	Field Operations Officer	01/09/2013	 Caryn M. Zacharias 2013.03.11 12:33:12 -07'00'
CST Tami M. Beduhn	Chief Survey Technician	01/09/2013	 Tami Beduhn 2013.03.12 12:03:13 -07'00'
HSST Douglas A. Bravo	Sheet Manager	01/09/2013	 Douglas Bravo 2013.03.11 12:54:29 -07'00'

F. Table of Acronyms

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

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

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

Chart Comparison

Chart	Kapp	Scale	Edition	Edition Date	NTM Date
16004	2409	1:700,000	12	2/1/2006	3/30/2013
16005	2410	1:700,000	10	10/1/2007	4/27/2013
16041	2420	1:51,639	8	12/29/2001	3/30/2013
16042	2421	1:51,024	7	7/1/2002	3/30/2013
16043	2422	1:50,819	7	7/12/1997	3/30/2013
16044	2423	1:50,819	7	1/11/1997	3/30/2013
16045	2424	1:50,615	7	10/12/1996	3/30/2013
16046	2425	1:50,204	7	10/1/2004	3/30/2013
16061	2426	1:50,000	8	1/26/2002	3/30/2013
16062	2427	1:49,794	7	10/12/1996	3/30/2013
16063	2428	1:49,590	7	7/27/1996	3/30/2013
16065	2430	1:49,177	6	12/21/1996	3/30/2013
16066	2431	1:48,973	7	6/1/2007	3/30/2013
16067	2432	1:48,767	7	7/5/1997	3/30/2013
16081	2433	1:48,149	7	10/1/2004	3/30/2013
16082	2434	1:47,943	7	4/1/2004	4/27/2013
16083	2435	1:50,000	6	11/1/2003	4/27/2013
16084	2436	1:50,000	7	6/1/2004	4/27/2013
16085	2437	1:50,000	6	12/1/2003	4/27/2013
16086	2438	1:50,000	7	3/1/2004	4/27/2013
16087	2439	1:50,000	7	10/1/2003	4/27/2013
16088	2440	1:50,000	5	10/1/2004	4/27/2013
16123	2447	1:50,000	6	9/1/2004	4/27/2013
16124	2448	1:50,000	6	10/1/2003	4/24/2013
16200	2449	1:400,000	14	10/01/2004	3/30/2013

Chart 16004

Chart agrees within 5 fathoms with the following exceptions:

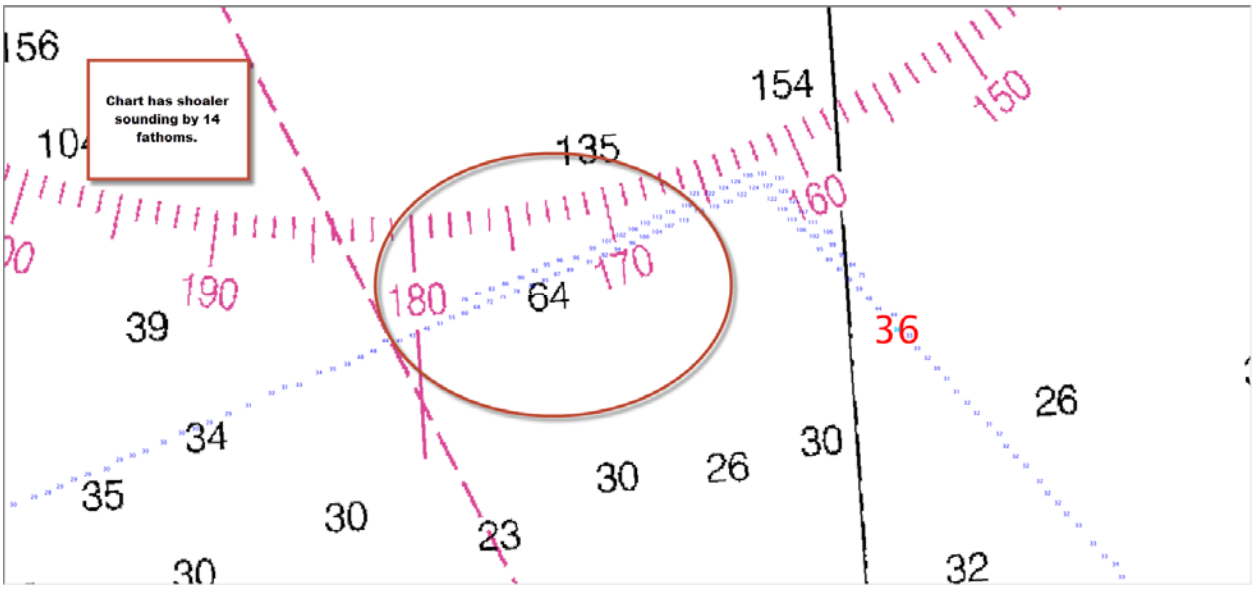


Figure 1: Location is approximately 70-33-59.00N, 143-17-59.00W. Charted sounding is 14 fathoms shoaler than what was charted.

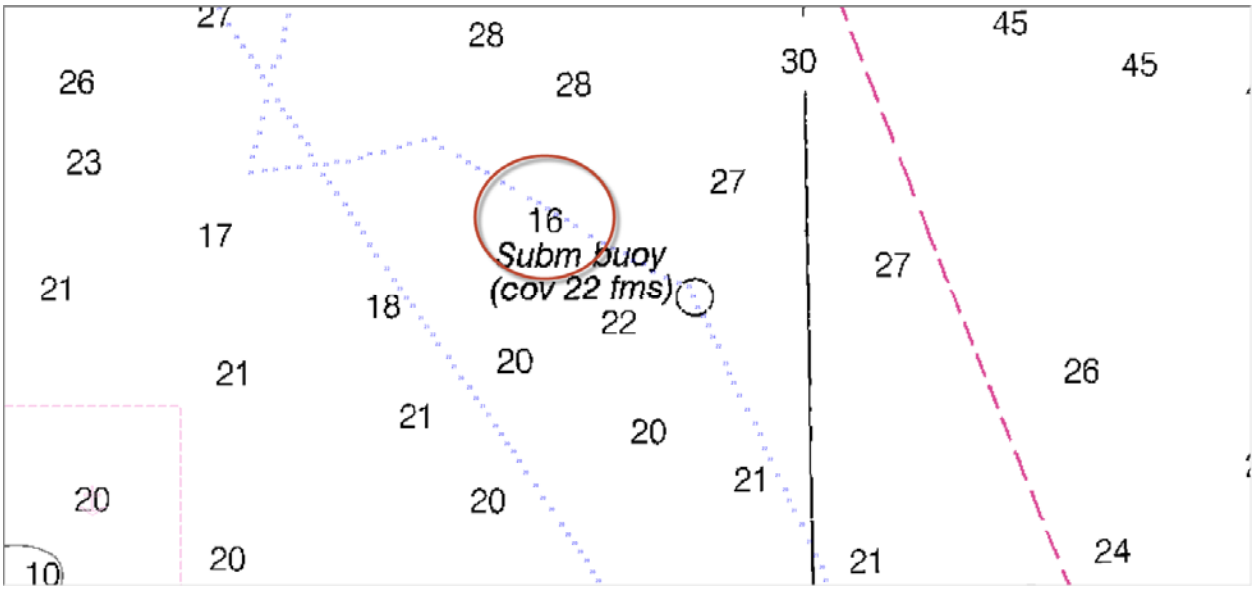


Figure 2: Field did not collect enough data to affirm or deny the existance of the charted submerged bouy. In addition, a charted 16 fathom sounding was found in the conflicted with the surveyed data by 9 fathoms. This area is located at 70-38-51.00N, 145-15-21.6W.

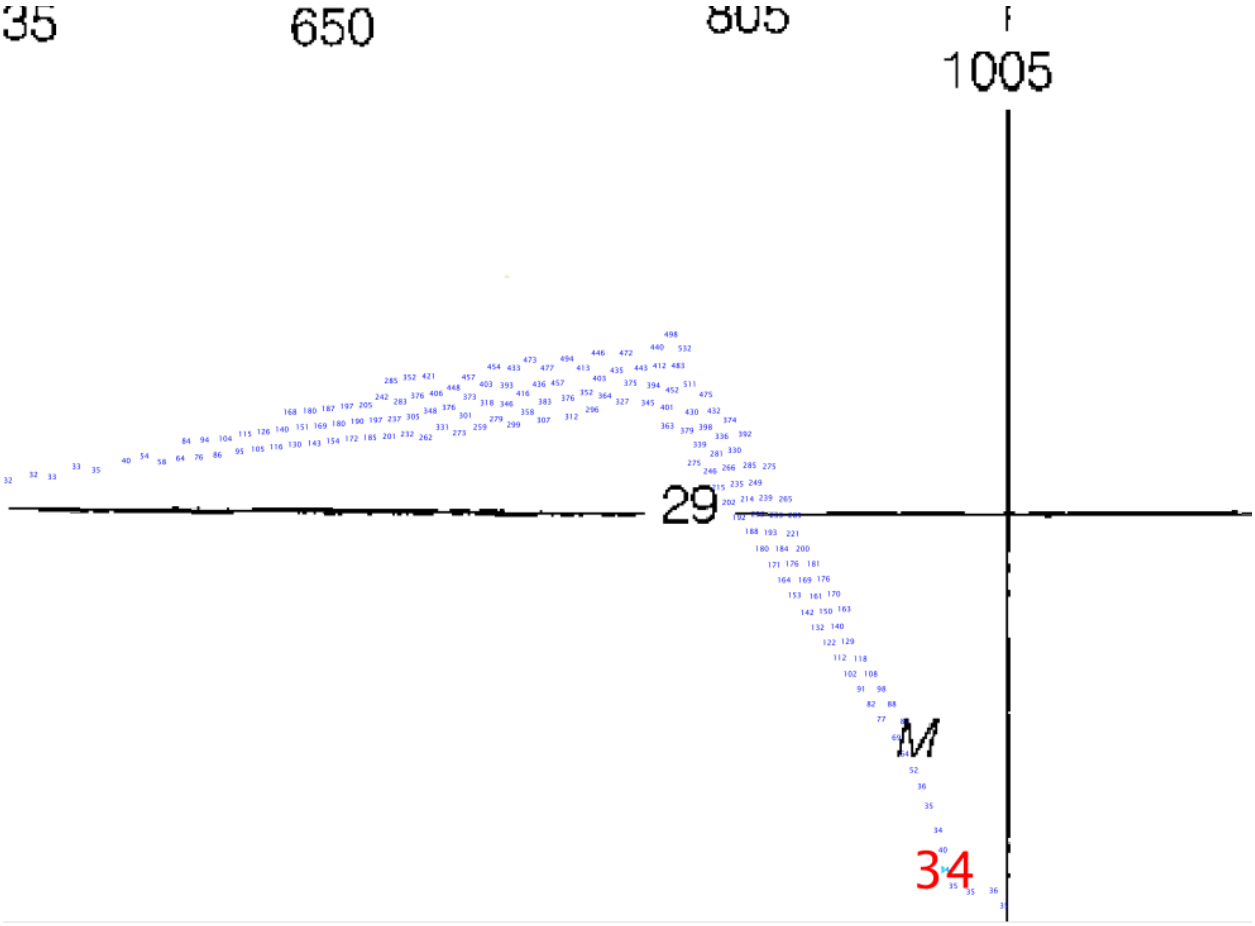


Figure 3: In the vacinity of a 29 fathom sounding the data the surveyed data is recorded as 202 fathoms. Location of this discrepancy is 71-00-17.0N, 147-12-51.83W.

UTM 5: Data agrees within 4 fathoms with the following exeptions.

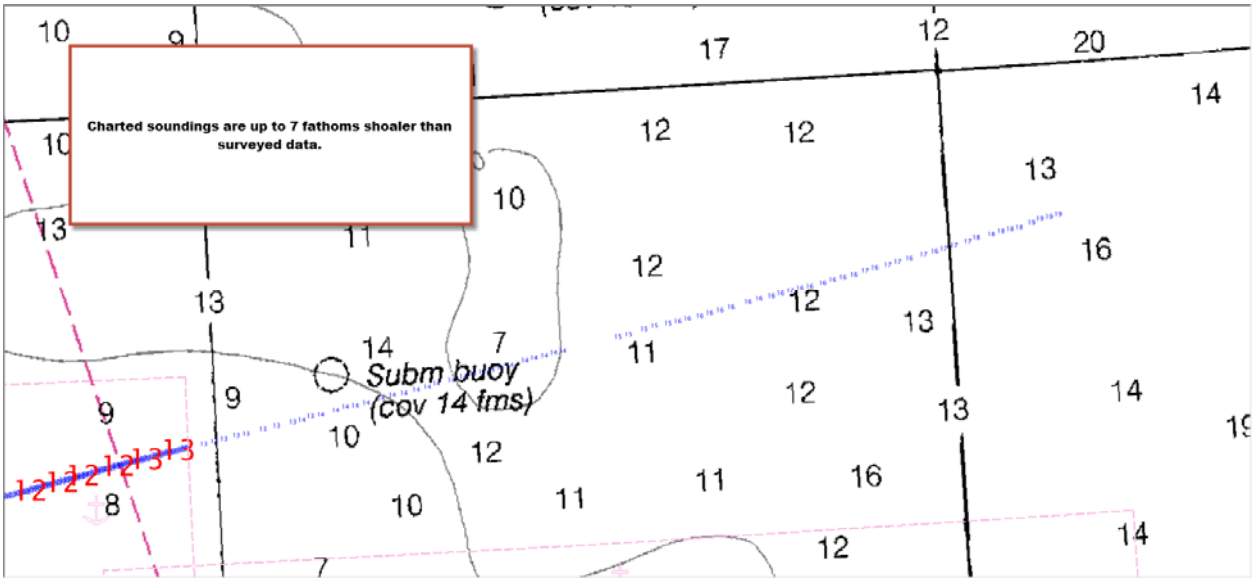


Figure 4: Charted soundings at about 70-53-23.12N, 149-31-58.87W are up to 7 fathoms shaoler than surveyed data.

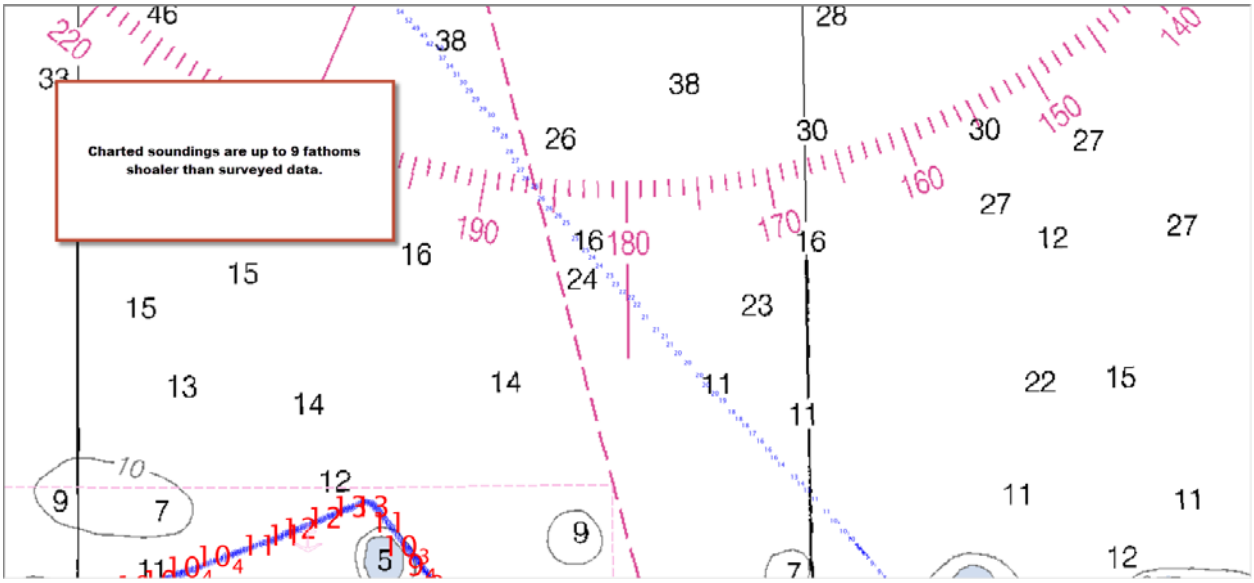


Figure 5: Approximate location of this example is 71-15-23.13N, 152-32-36.49W.

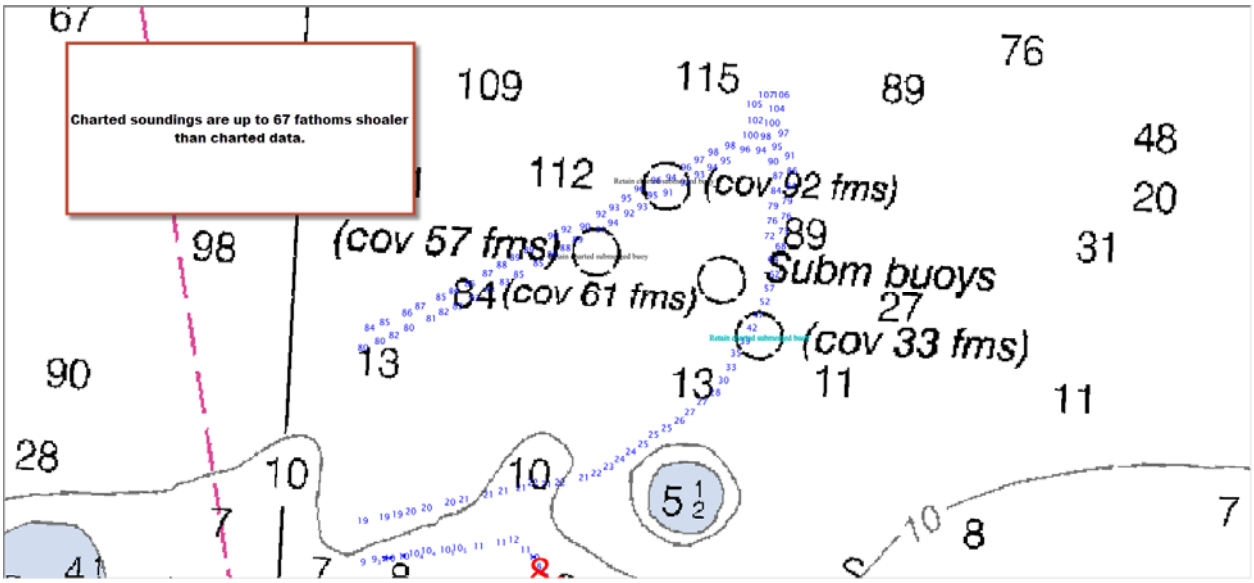


Figure 6: One of the most significant differences between charted soundings and surveyed data is located at 71-32-29N, 155-54-59.8W.

Chart 16005

Chart and survey area agrees within 5 fathoms with the following exceptions:

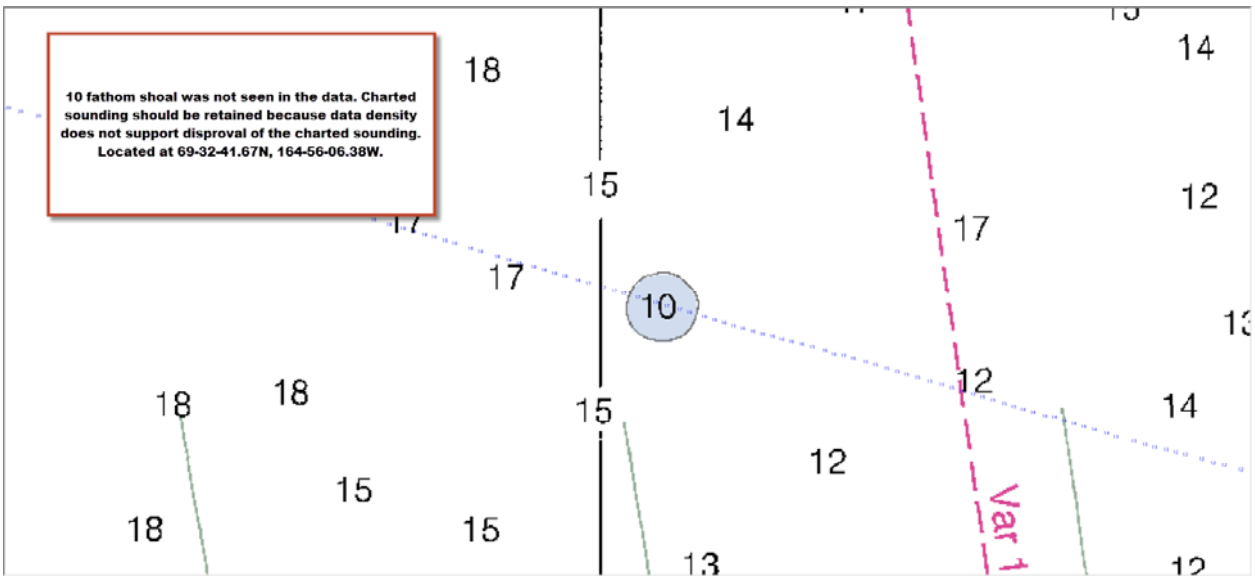


Figure 7: Shoal was not disproved by field and warrents further investigation.

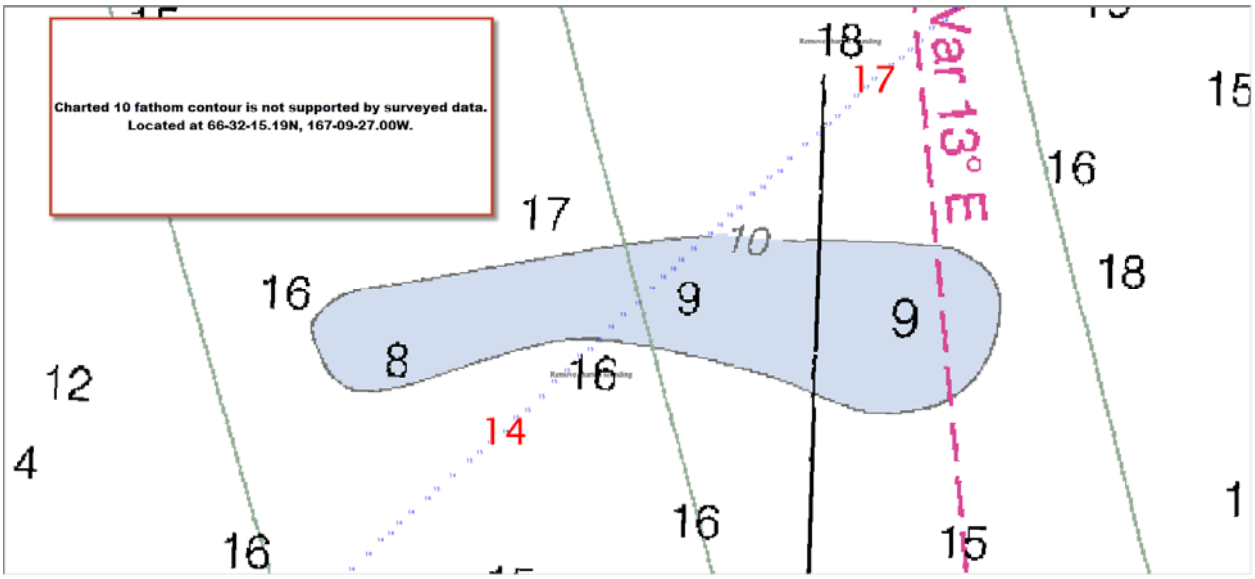


Figure 8: Shoal was not found in survey data and warrants further investigation.

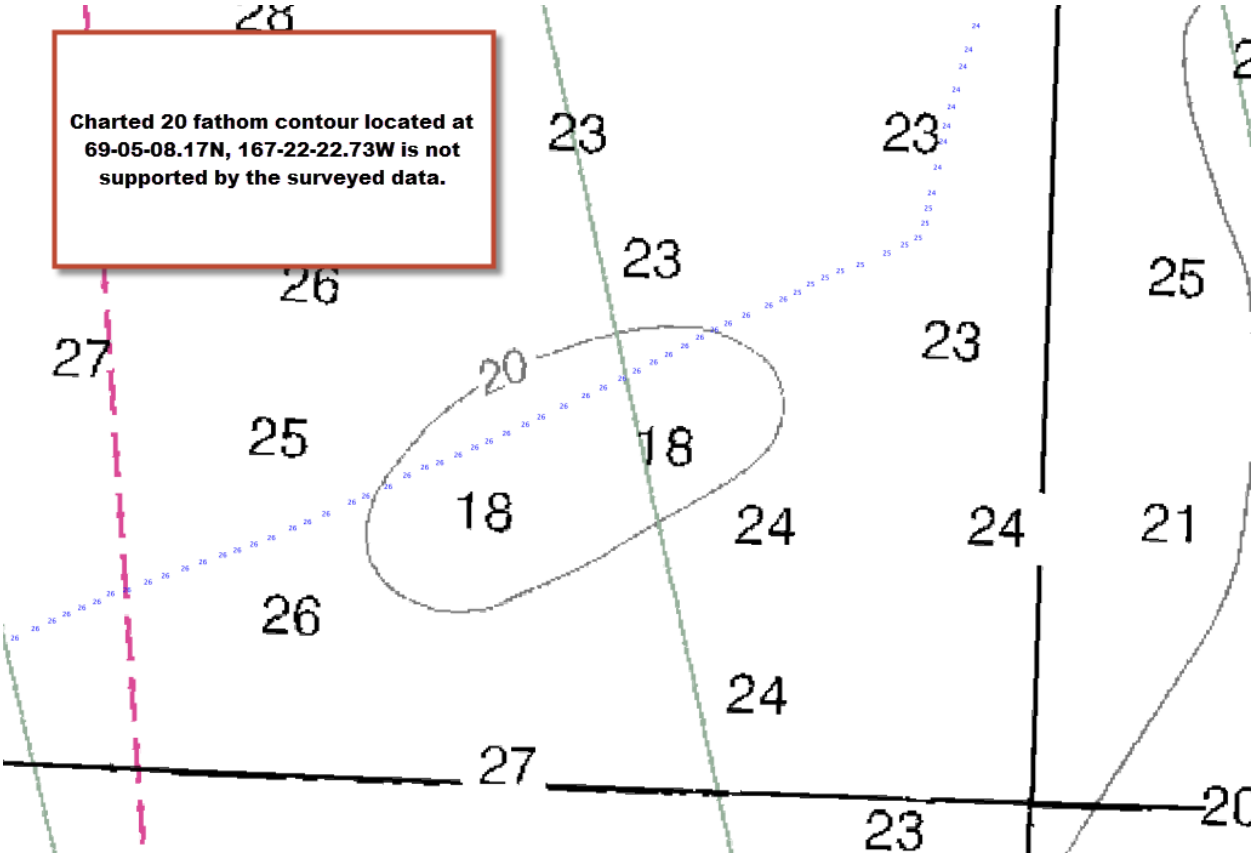


Figure 9: Contour not verified and warrants further investigation.

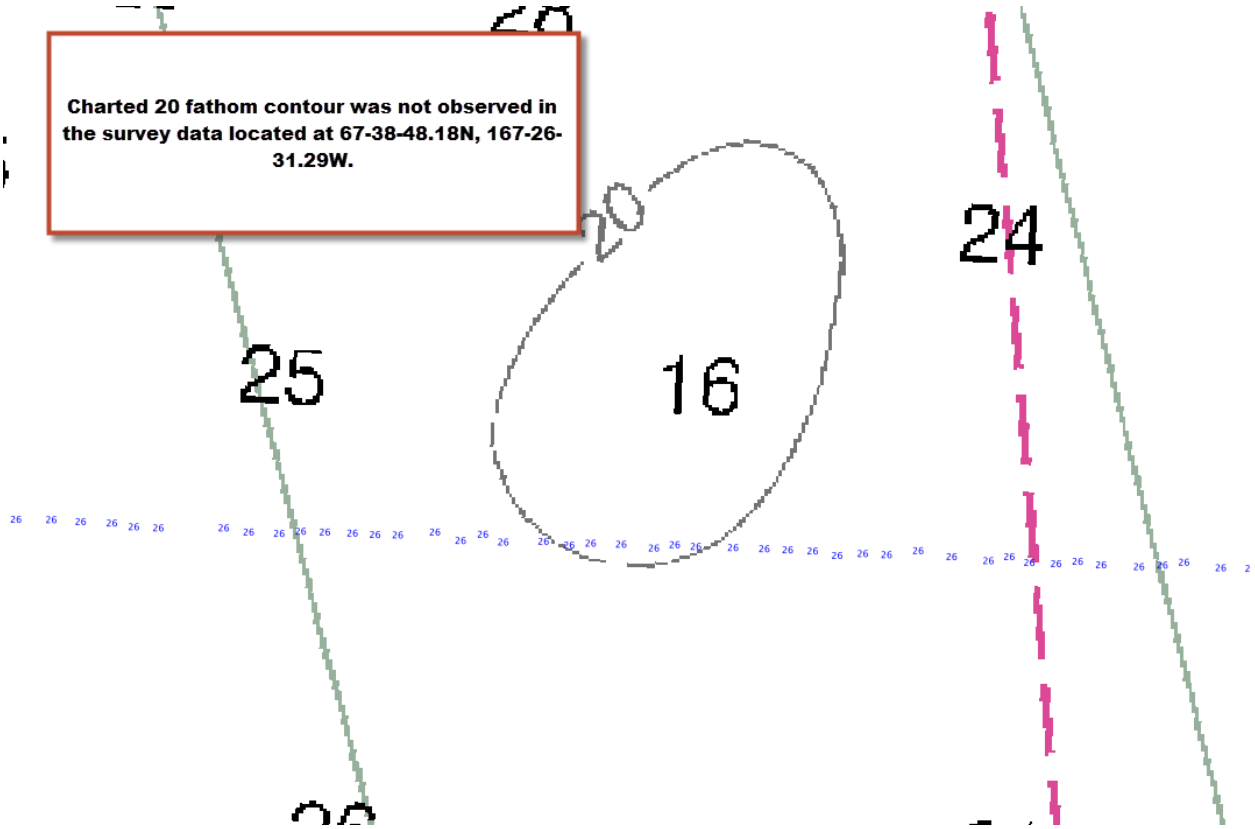


Figure 10: Contour not verified and warrents further investigation.

Chart 16041

Surveyed soundings agree within 6 feet of charted depths; there are no navigationally significant differences to note.

Chart 16042

Most of the chart did not contain soundings where the data was collected. In the northwest section of the chart the data conflicts with what is charted up to 30 feet. The new data is deeper. The compiler will retain the charted soundings.

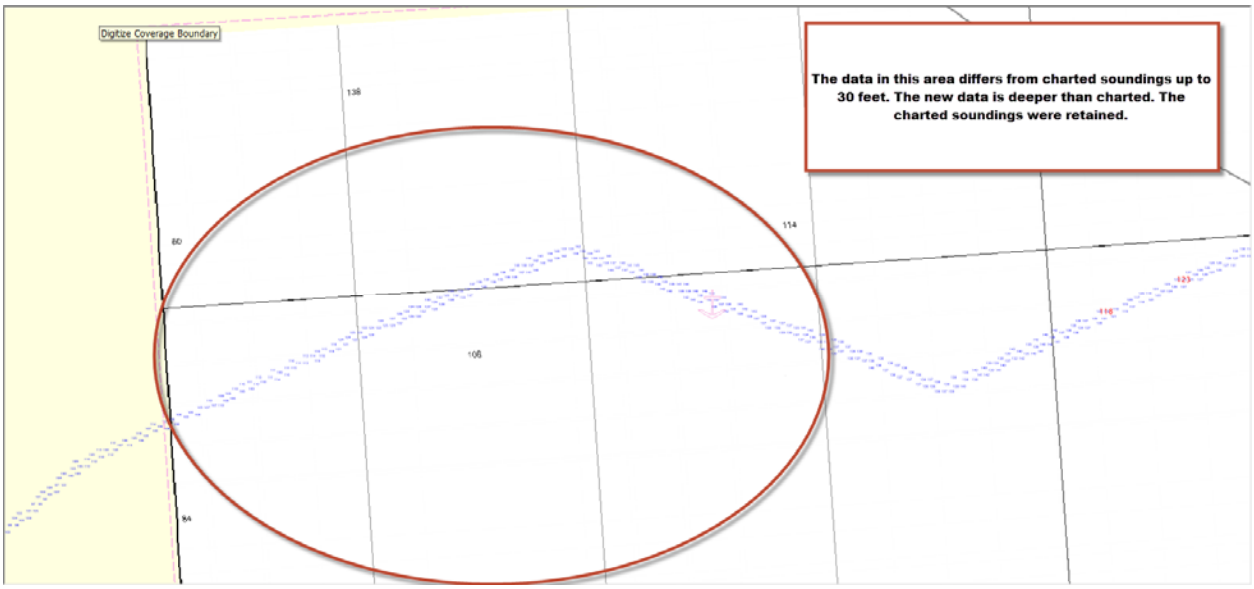


Figure 11: Northwest section of the chart where survey data is significantly deeper than charted soundings and was not used in the HCell.

Chart 16043

Surveyed soundings agree within 4 feet of charted depths; there are no navigationally significant differences to note.

Chart 16044

Data agrees with chart within 6 feet of charted soundings with exception to a shoal located at about 70-06-09.6N, 145-21-13.67W. The shoal has seemed to have shifted. The charted soundings are more conservative and should be retained. Further investigation of this shoal is warranted.

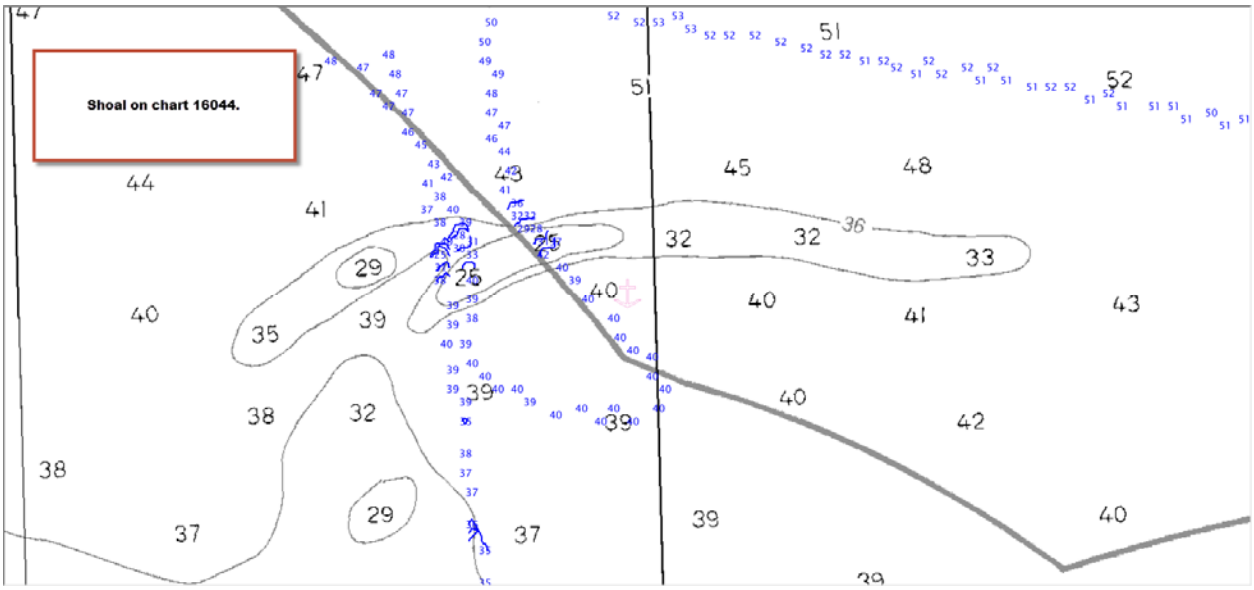


Figure 12: Contour appears to have shifted and warrants a further investigation.

Chart 16045

Charted soundings agree within 6 feet. A charted submerged bouy located at 70-21-59.00N, 146-00-0.5W was not observed in the data. The charted feature shall be retained but warrents further investigation.

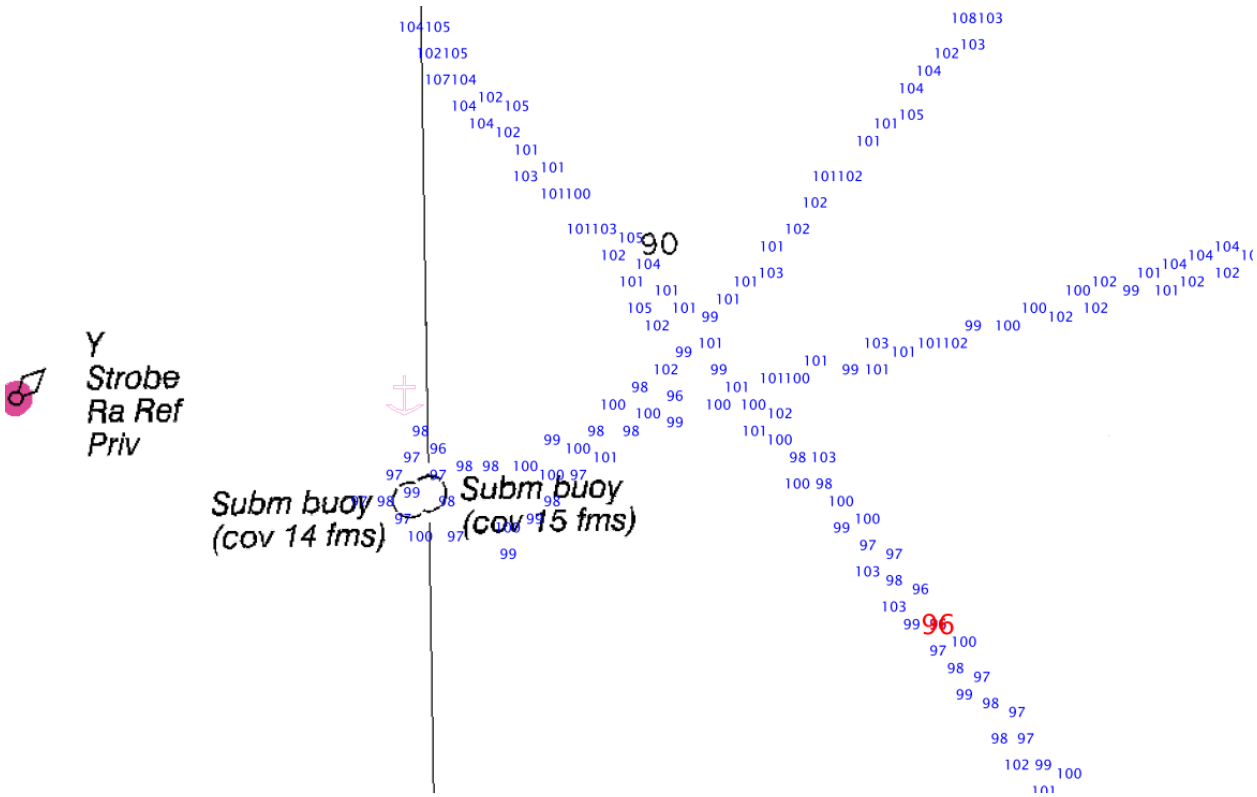


Figure 13: Submerged buoys should be retained.

Chart 16046

Large discrepancies are seen between charted soundings and data especially within the northwest portion of the chart. New depths are 30 feet deeper than what is charted.

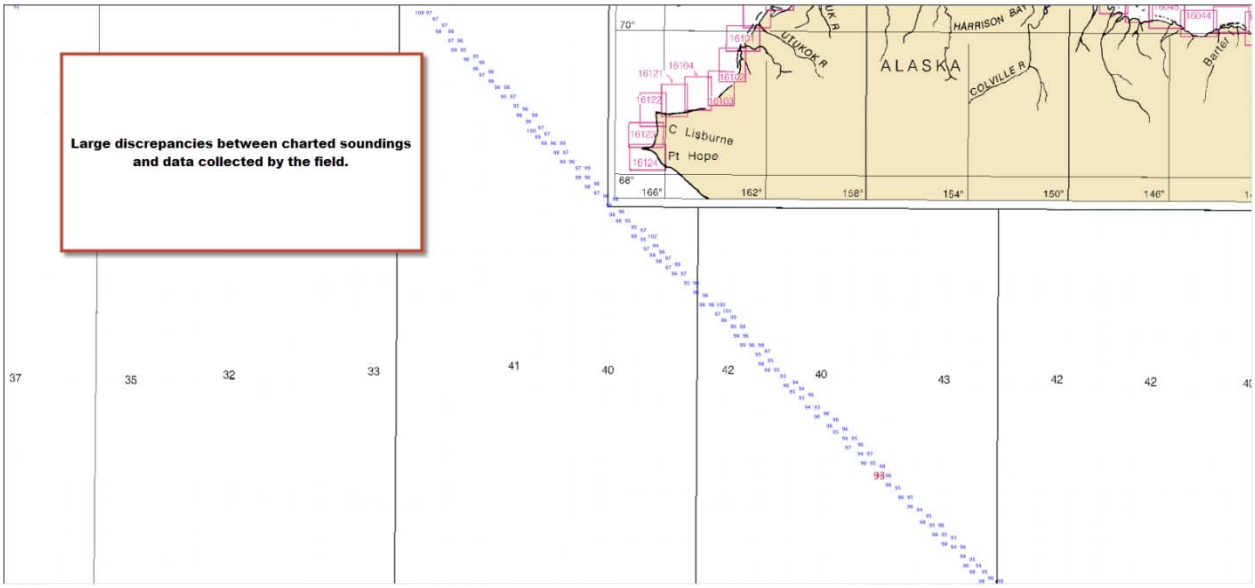


Figure 14: Charted soundings are significantly shoaler than surveyed soundings. New soundings were not used in HCell.

Chart 16061

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16062

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16063

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16065

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16066

Chart and survey data generally agrees within 6 feet. The 60 foot contor appears to have shifted 4300m to the north.

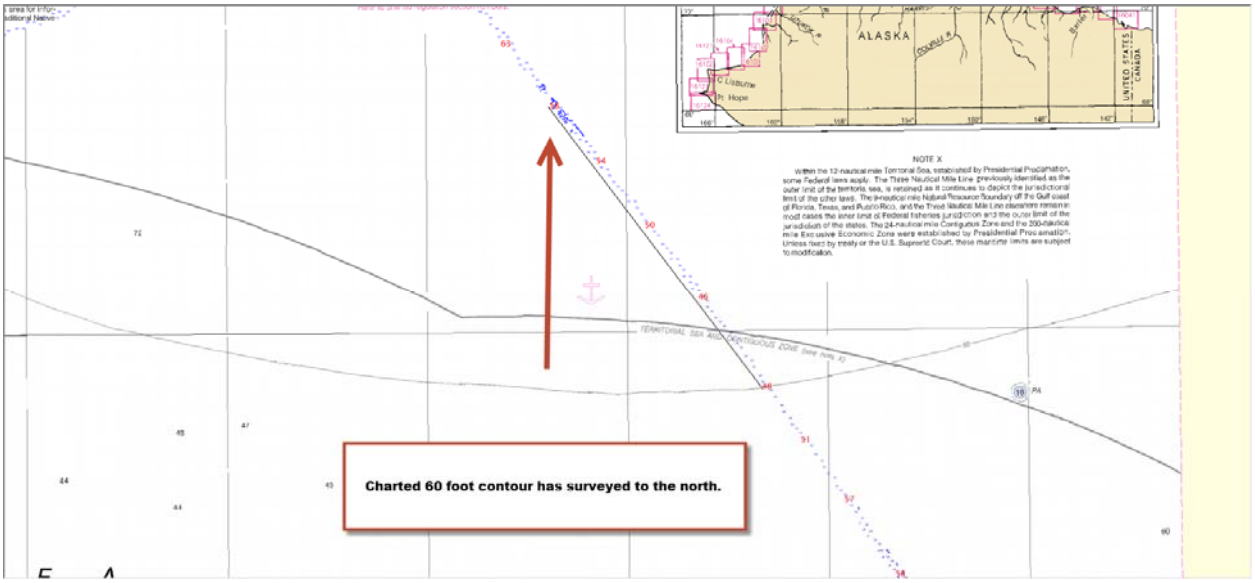


Figure 15: Sixy foot contour appears to have shifted to the North.

Chart 16067

Surveyed soundings agree within 6 feet of charted depths; there are no navigationally significant differences to note.

Chart 16081

Surveyed soundings agree within 5 feet of charted depths; there are no navigationally significant differences to note.

Chart 16082

Chart and survey data agree within 7 feet with the following exceptions:

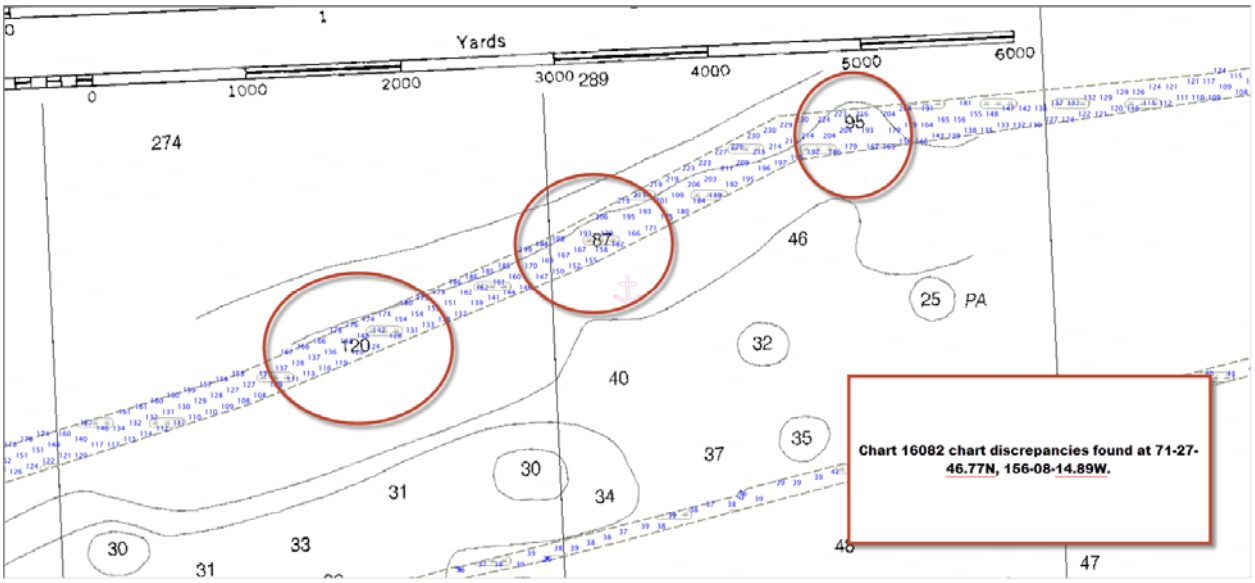


Figure 16: Charted soundings are shoaler than surveyed soundings up to 109 feet.

Chart 16083

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16084

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16085

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16086

Chart and survey data agree within 7 feet with the following exception:

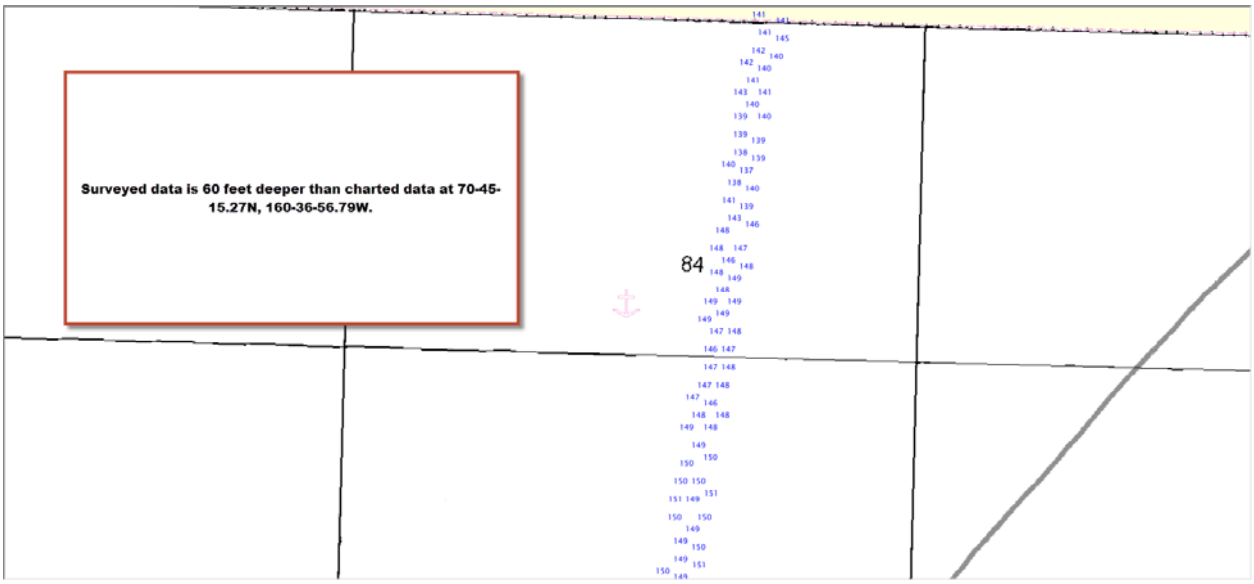


Figure 17: Surveyed data is over 60 feet deeper than charted soundings. Retain charted soundings in this area. Futher investigation is warrented.

Chart 16087

Chart and surevey data agree within 6 feet with the following exception:

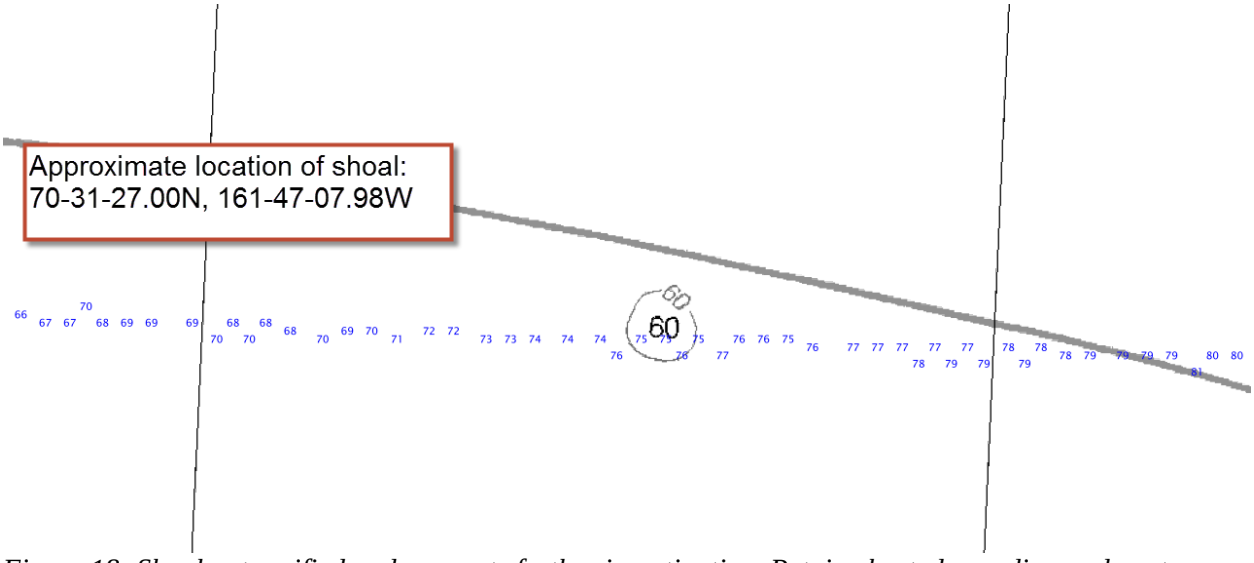


Figure 18: Shoal not verified and warrents further investigation. Retain charted sounding and contour.

Chart 16088

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16123

Chart agrees within 7 feet with the following exceptions:

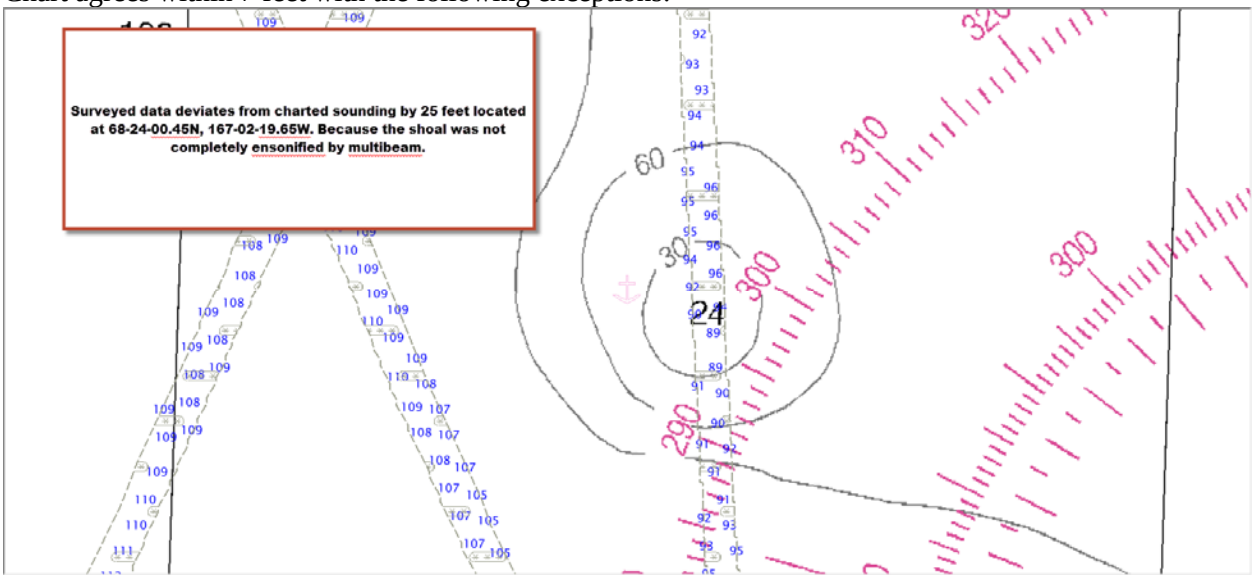


Figure 19: Surveyed data was 25 feet deeper than charted and warrants further investigation.

Chart 16124

Surveyed soundings agree within 7 feet of charted depths; there are no navigationally significant differences to note.

Chart 16200

Surveyed soundings agree within 3 fathoms of charted depths; there are no navigationally significant differences to note.

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 3, 2012

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: M-S974-FA-2012
HYDROGRAPHIC SHEET: D00168

LOCALITY: Bering Strait, Arctic Ocean, AK
TIME PERIOD: August 5 - 24, 2012

TIDE STATION USED: 949-1094 Red Dog Dock, AK
Lat. 67° 34.6'N Long. 164° 03.9' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.240 meters

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: Use zoning file "D00168CORP"

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).

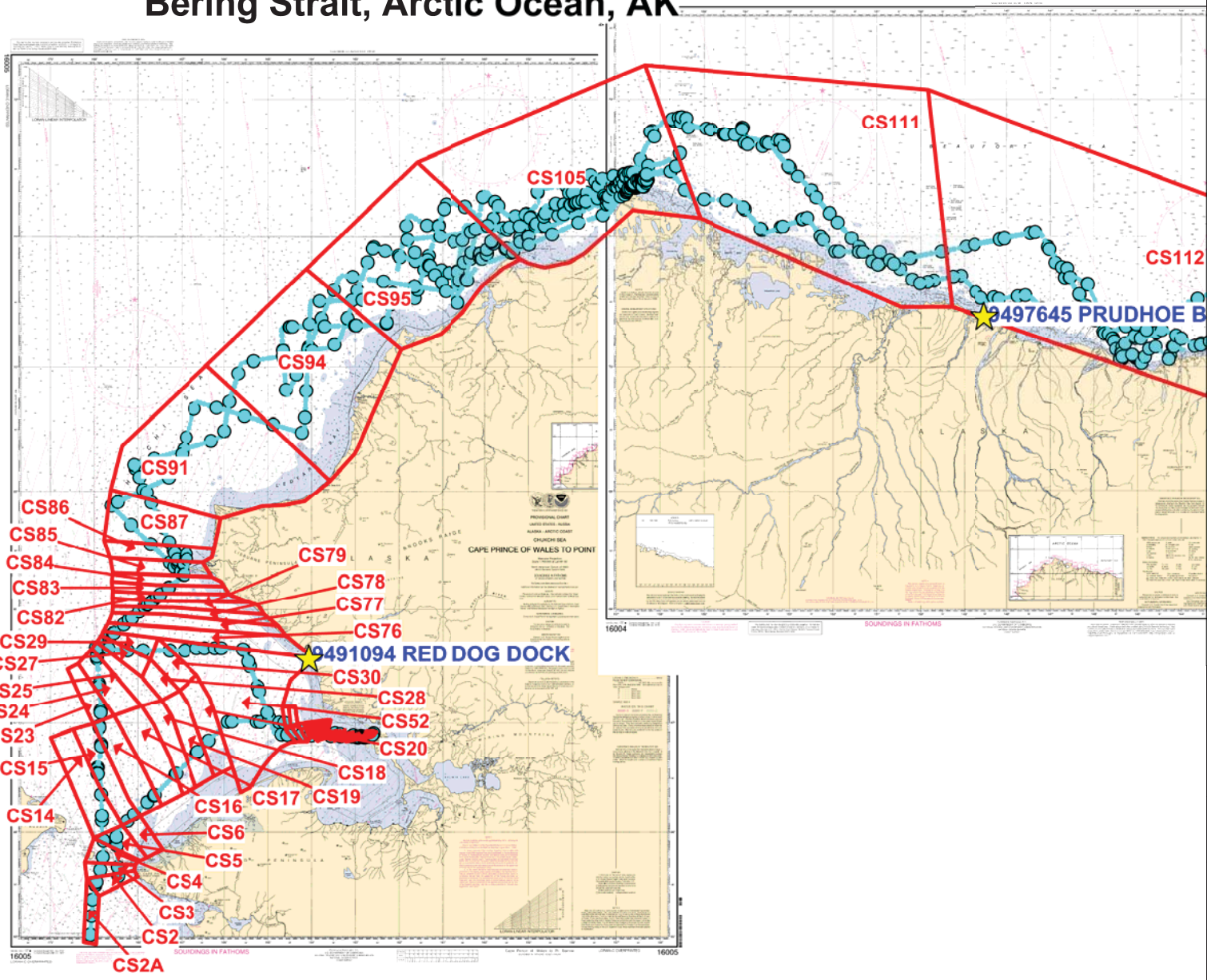
Note 2: The error estimations between Red Dog Dock and Cape Krusentern, and Red Dog Dock and Kotzebue are 0.18m and 0.24m, respectively. The error could be much higher for the survey tracklines near the amphidromic point. A subordinate station on the SW shore of the entrance is strongly recommended to help us better understand the tidal regime, determine the location of the amphidromic point, bound the zoning error and update co-tidal lines and zones as appropriate.

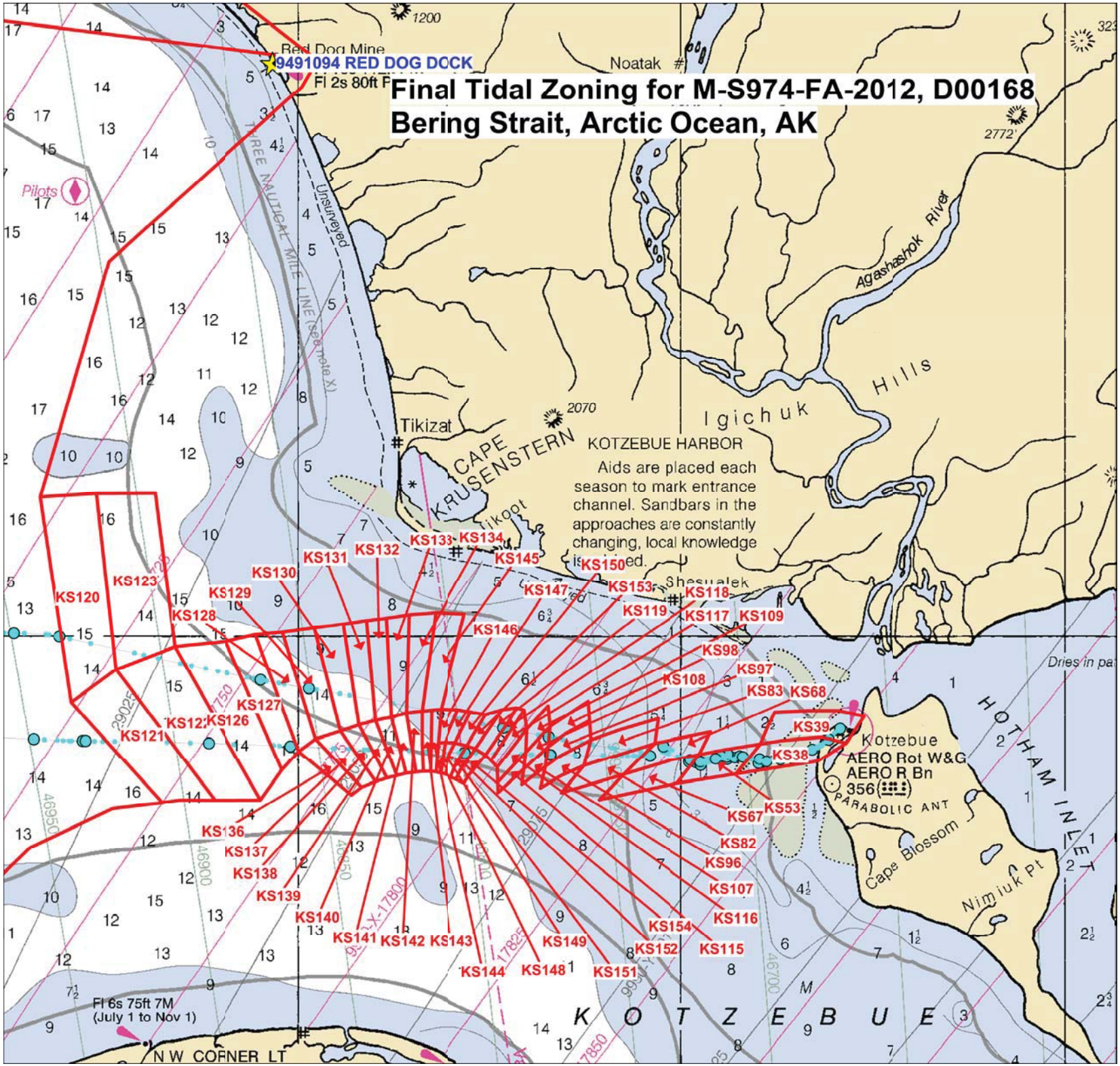
HOVIS.GERALD.THOMAS.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2012.10.09 14:54:12 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH

Final Tidal Zoning for M-S974-FA-2012, D00168
Bering Strait, Arctic Ocean, AK




Final Tidal Zoning for M-S974-FA-2012, D00168
Bering Strait, Arctic Ocean, AK
9491094 RED DOG DOCK
Red Dog Mine
Fl 2s 80ft
Noatak
Pilots
THREE NAUTICAL MILE LINE (see note X)
Unsurveyed
Agashashok River
Igichuk Hills
Tikizat
CAPE KRUSENSTERN
KOTZEBUE HARBOR
Aids are placed each season to mark entrance channel. Sandbars in the approaches are constantly changing, local knowledge is ed.
Tikoot
Shesualek
KS120
KS123
KS128
KS129
KS130
KS131
KS132
KS133
KS134
KS145
KS150
KS153
KS147
KS146
KS118
KS119
KS117
KS109
KS98
KS97
KS108
KS83
KS68
KS39
KS38
KS53
KS67
KS82
KS96
KS107
KS116
KS154
KS152
KS115
KS151
KS149
KS148
KS144
KS143
KS142
KS141
KS140
KS139
KS138
KS137
KS136
KS121
KS122
KS126
KS127
Kotzebue
AERO Rot W&G
AERO R Bn
356
PARABOLIC ANT
Cape Blossom
Nimiuk Pt
HOTHAM INLET
Dries in pa
Fl 6s 75ft 7M
(July 1 to Nov 1)
N W CORNER LT
K O T Z E B U E

Tami Beduhn - NOAA Federal <tami.beduhn@noaa.gov>

Surfaces List Print out

5 messages

Caryn Zacharias <Caryn.Zacharias@noaa.gov> Fri, Jan 4, 2013 at 7:44 PM
To: _NOS OCS HSD XML Descriptive Reports <xml.dr@noaa.gov>
Cc: _OMAO MOP ChiefST Fairweather <ChiefST.Fairweather@noaa.gov>, _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>

Would it be possible to get a fix for the DR Print out specifically for the surface list print out in section B.5. We have over 48 surfaces listed and only half are printed in the PDF.

Thank you,
Caryn

--
LT Caryn Zacharias (Arnold), NOAA
Operations Officer
NOAA Ship *Fairweather*
1010 Stedman Street
Ketchikan, AK 99901
Ship Cell 907-254-2842

Caryn Zacharias <Caryn.Zacharias@noaa.gov> Fri, Jan 4, 2013 at 8:28 PM
To: Lucy Hick <Lucy.Hick@noaa.gov>
Bcc: ChiefST.Fairweather@noaa.gov

Hi Lucy,

The archived XML is attached.

Thank you very much. Have a great weekend,
Caryn

On Fri, Jan 4, 2013 at 8:00 PM, Lucy Hick <Lucy.Hick@noaa.gov> wrote:

> Caryn,
>
> Can you archive the XML and send to me. I will look into it on Monday.
>
> Lucy
> [Quoted text hidden]
> [Quoted text hidden]

[Quoted text hidden]

D00168_DR_Surfaces.zip
3341K

Caryn Zacharias <Caryn.Zacharias@noaa.gov> Thu, Jan 10, 2013 at 3:34 PM
To: Lucy Hick <Lucy.Hick@noaa.gov>
Bcc: ChiefST.Fairweather@noaa.gov

Hi Lucy,

Just checking on the status of this request. Were you able to figure out anything?

Thanks,
Caryn
[Quoted text hidden]
Departing Operations Officer
[Quoted text hidden]

Caryn Zacharias <Caryn.Zacharias@noaa.gov> Thu, Jan 10, 2013 at 4:22 PM
To: Lucy Hick <Lucy.Hick@noaa.gov>
Cc: _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>, _OMAO MOP ChiefST Fairweather <ChiefST.Fairweather@noaa.gov>

Great thank you!

Caryn

On Thu, Jan 10, 2013 at 3:45 PM, Lucy Hick <Lucy.Hick@noaa.gov> wrote:

> Hi Caryn,
>
> It has to do with the Stylesheet and the rule that keeps tables constrained to one page.
>
> I will try to send out a solution tomorrow.
>
> Lucy
> [Quoted text hidden]

[Quoted text hidden]

Lucy Hick - NOAA Federal <Lucy.Hick@noaa.gov> Fri, Jan 11, 2013 at 1:26 PM
To: Caryn Zacharias <Caryn.Zacharias@noaa.gov>
Cc: _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>, _OMAO MOP ChiefST Fairweather <ChiefST.Fairweather@noaa.gov>, xml.dr@noaa.gov

Hi Caryn,

I have been unable to solve this issue and have been having some issues with the Stylesheet software. I have put in a Help Desk ticket with Altova, and will update you as soon as they respond back. Sorry for the delay.

Lucy
[Quoted text hidden]
--

Lucy Hick
Physical Scientist / COR-In-Training
Hydrographic Surveys Division - Operations Branch
Office of Coast Survey
National Oceanic & Atmospheric Administration
(301) 713-2702 x125
Lucy.Hick@noaa.gov

Tami Beduhn - NOAA Federal <tami.beduhn@noaa.gov>

D00168 Finalized Surface

Marc Moser - NOAA Federal <Marc.S.Moser@noaa.gov> Wed, Jan 23, 2013 at 1:27 PM
To: Caryn Zacharias <Caryn.Zacharias@noaa.gov>
Cc: Crescent Moegling - NOAA Federal <Crescent.Moegling@noaa.gov>, _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>, Clinton Marcus - NOAA Federal <Clinton.R.Marcus@noaa.gov>, _OMAO MOP ChiefST Fairweather <ChiefST.Fairweather@noaa.gov>, Douglas Bravo <Douglas.A.Bravo@noaa.gov>

No objection from Ops.

On Wed, Jan 23, 2013 at 4:02 PM, Caryn Zacharias <caryn.zacharias@noaa.gov> wrote:

> Good afternoon,
>
> I would like to request permission to extend the 4m finalized surface depth range for the North Arctic UTM 4. Two soundings extend beyond the 80 meter range (80.29meters). We would like to extend the depth range of the 4m surface to include these 2 soundings.
>
> The proposed ranges:
> 1m: 0-20m
> 2m: 18-40m
> 4m: 36-85m
>
> V/r,
> Caryn
>
> --
> LT Caryn Zacharias (Arnold), NOAA
> Departing Operations Officer
> NOAA Ship *Fairweather*
> 1010 Stedman Street
> Ketchikan, AK 99901
> Ship Cell 907-254-2842

--
LCDR Marc S. Moser, NOAA
Chief, Operations Branch
SSMC3, Rm: 6854, N/CS31, 1315 East West Highway
Silver Spring, MD 20910
Tel: (301) 713-2702 x112, Fax: (301) 713-4533, Cel: (757) 339-1950

From <OPS.Fairweather@noaa.gov>

Sent Friday, December 14, 2012 6:53 pm

To coast.pilot@noaa.gov osc.ndb@noaa.gov

Cc ChiefST.Fairweather@noaa.gov phb.chief@noaa.gov CO.fairweather@noaa.gov

Bcc timothy.m.smith@noaa.gov

Subject FA 2012 Coast Pilot Reviews

Attachments						
	CP9-11-29Ed-page 405-406_rev09_2012.rtf	45K	CP9-11-29Ed-pages 332-452_rev10_2012.rtf	131K	CP9-11-29Ed-pages 449-460_rev10_2012.rtf	103K
	CP7-12-44Ed-pages 518-521_rev11_2012.rtf	79K	CP9-11-29Ed-pages 223-242_rev_12_2012.rtf	229K	CP7-12-44Ed-pages 524-529_rev12_2012.rtf	2.2MB

Please see the attached Coast Pilot Reviews for:

M-R908-FA-12 Bristol Bay, AK (D00169 & D00170)
M-R976-FA-12 South Arctic (D00167)
M-S974-FA-12 North Arctic (D00168)
OPR-N326-FA-12 Admiralty Inlet (H12418, H12419 & H12420)
OPR-P136-FA-12 North Coast Kodiak Island (F00618, H12318 & H12319)
S-N923-FA-12 Elliot Bay (F00613)

V/r,
Caryn

--
LT Caryn Zacharias (Arnold), NOAA
Field Operations Officer
NOAA Ship Fairweather
1010 Stedman Street
Ketchikan, AK 99901
Ship Cell 907-254-2842
Ship Sat 808-659-0054

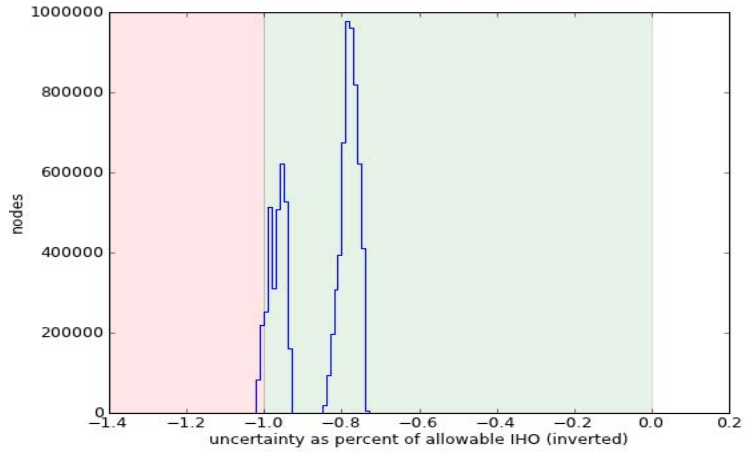
D00168_UTM06_1m_Final_0to20_Density_IHO

The finalized surface has 8682991 nodes with 251770225 soundings.

Uncertainty Standards

96.52% | PASS

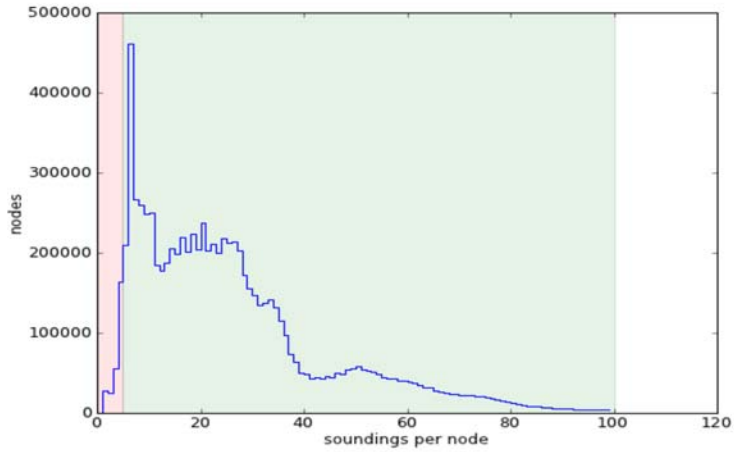
Nodes with Uncertainty less then or equal allowable IHO error **96.52%** (8380523/8682991).



Object Detection Coverage

96.88% | PASS

Nodes with 5 or more soundings **96.88%** (8412496/8682991).
Sounding count average is **29.00** soundings per node.
Sounding count mode is **7** soundings per node.



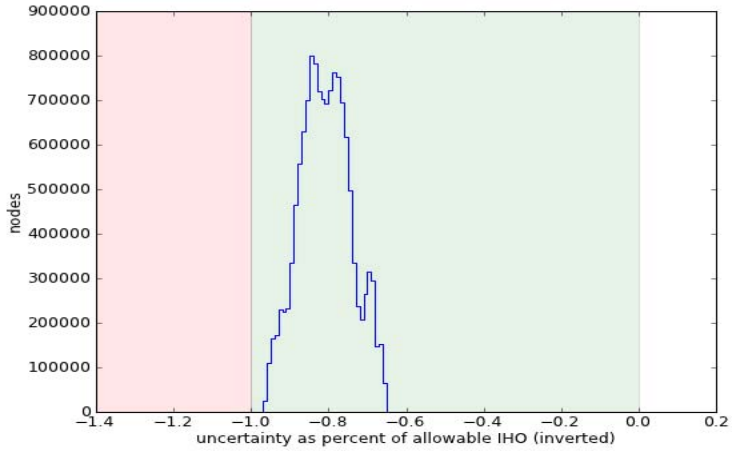
D00168_UTM06_2m_Final_18to40_Density_IHO

The finalized surface has 13613237 nodes with 196729778 soundings.

Uncertainty Standards

100.00% | PASS

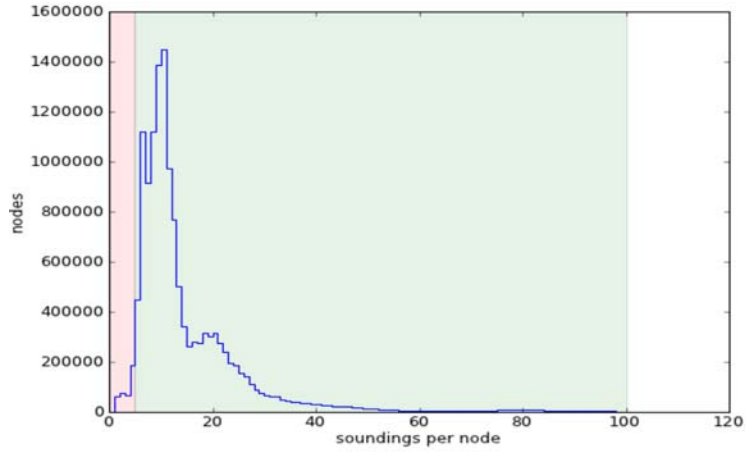
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (13613237/13613237).



Object Detection Coverage

97.12% | PASS

Nodes with 5 or more soundings **97.12%** (13221131/13613237).
Sounding count average is **14.45** soundings per node.
Sounding count mode is **11** soundings per node.



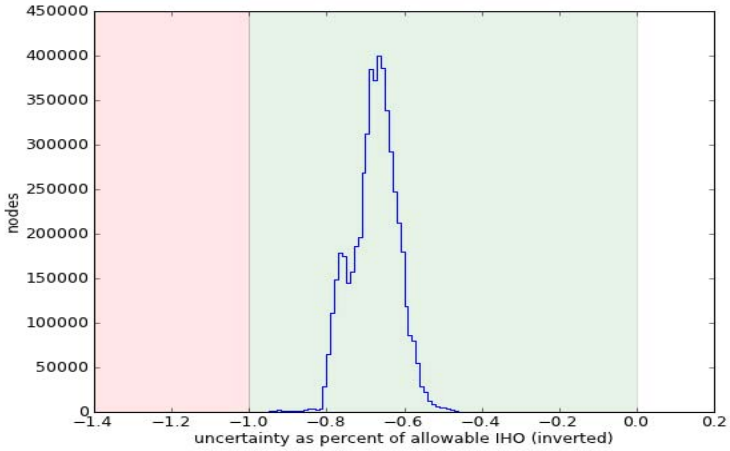
D00168_UTM06_4m_Final_36to80_Density_IHO

The finalized surface has 5250835 nodes with 99298134 soundings.

Uncertainty Standards

100.00% | PASS

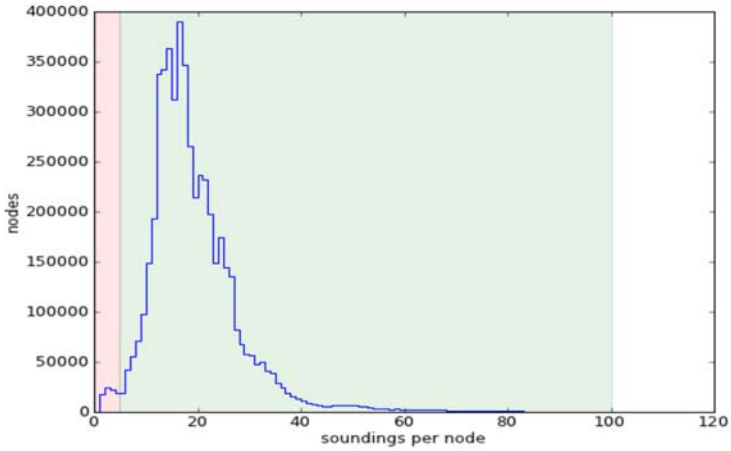
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (5250835/5250835).



Object Detection Coverage

98.40% | PASS

Nodes with 5 or more soundings **98.40%** (5166930/5250835).
Sounding count average is **18.91** soundings per node.
Sounding count mode is **17** soundings per node.



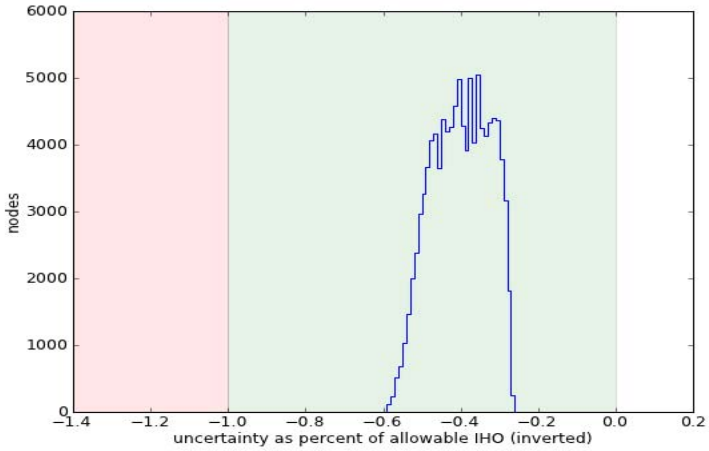
D00168_UTM06_8m_Final_72to100_Density_IHO

The finalized surface has 105427 nodes with 1472998 soundings.

Uncertainty Standards

100.00% | PASS

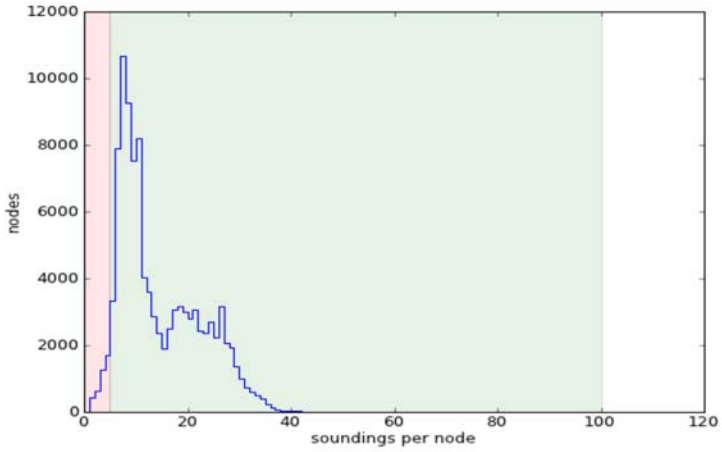
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (105427/105427).



Object Detection Coverage

96.17% | PASS

Nodes with 5 or more soundings **96.17%** (101387/105427).
Sounding count average is **13.97** soundings per node.
Sounding count mode is **8** soundings per node.



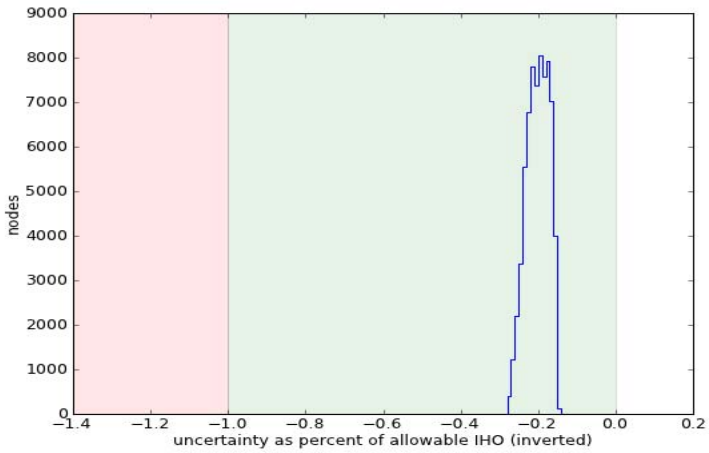
D00168_UTM06_8m_Final_100to160_Density_IHO

The finalized surface has 69409 nodes with 650941 soundings.

Uncertainty Standards

100.00% | PASS

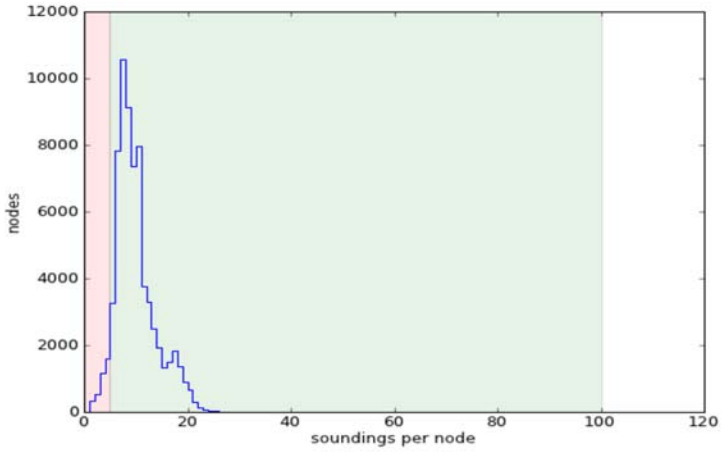
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (69409/69409).



Object Detection Coverage

94.77% | FAIL

Nodes with 5 or more soundings **94.77%** (65782/69409).
Sounding count average is **9.38** soundings per node.
Sounding count mode is **8** soundings per node.



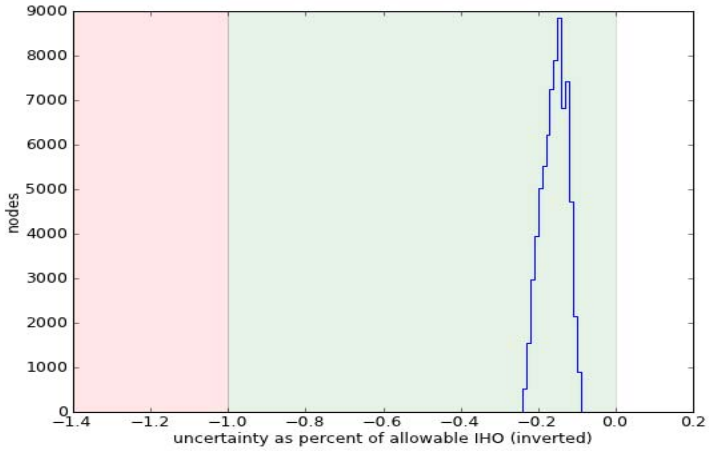
D00168_UTM06_16m_Final_144to320_Density_IHO

The finalized surface has 71802 nodes with 1190453 soundings.

Uncertainty Standards

100.00% | PASS

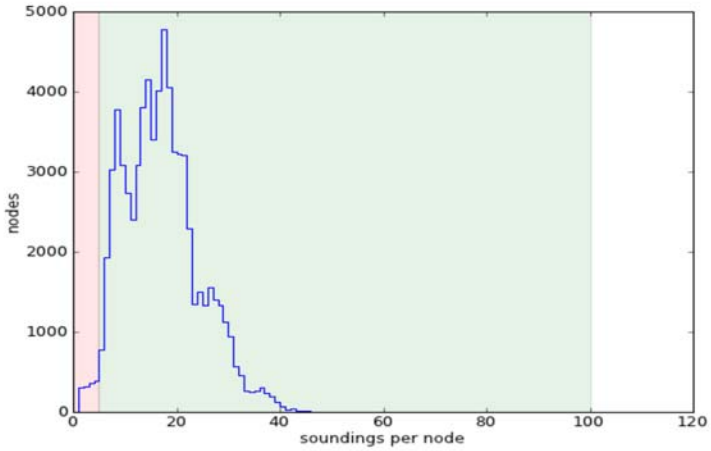
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (71802/71802).



Object Detection Coverage

98.09% | PASS

Nodes with 5 or more soundings **98.09%** (70428/71802).
Sounding count average is **16.58** soundings per node.
Sounding count mode is **18** soundings per node.



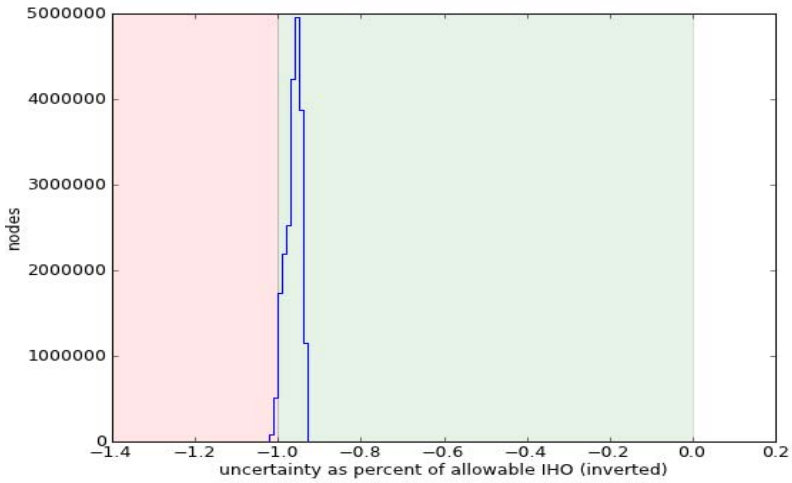
D00168_UTM05_1m_Final_0to20_Density_IHO

The finalized surface has 21267948 nodes with 203691216 soundings.

Uncertainty Standards

97.21% | PASS

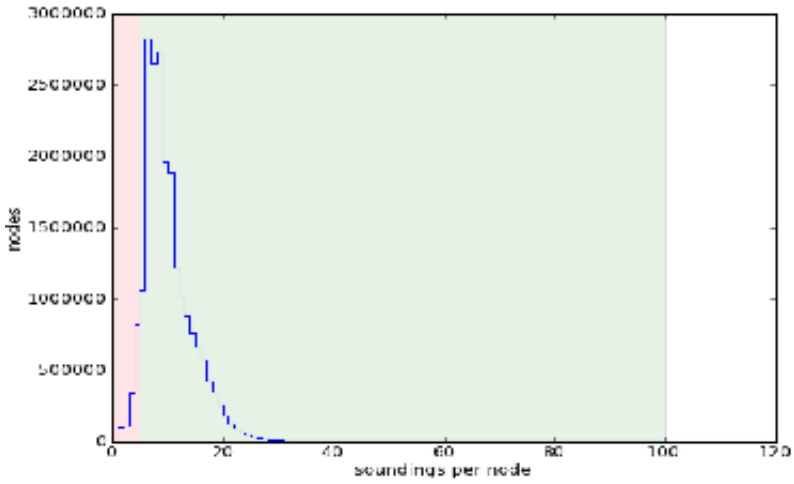
Nodes with Uncertainty less then or equal allowable IHO error **97.21%** (20674617/21267948).



Object Detection Coverage

93.55% | FAIL

Nodes with 5 or more soundings **93.55%** (19896987/21267948).
Sounding count average is **9.58** soundings per node.
Sounding count mode is **7** soundings per node.



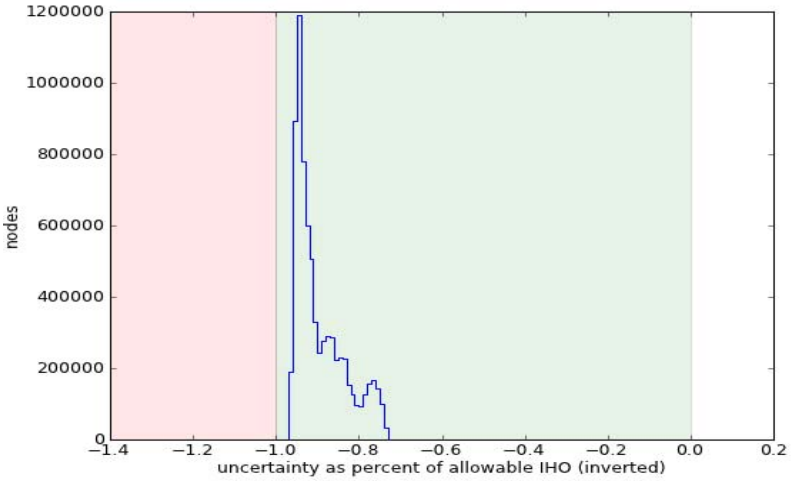
D00168_UTM05_2m_Final_18to40_Density_IHO

The finalized surface has 7460683 nodes with 128558171 soundings.

Uncertainty Standards

100.00% | PASS

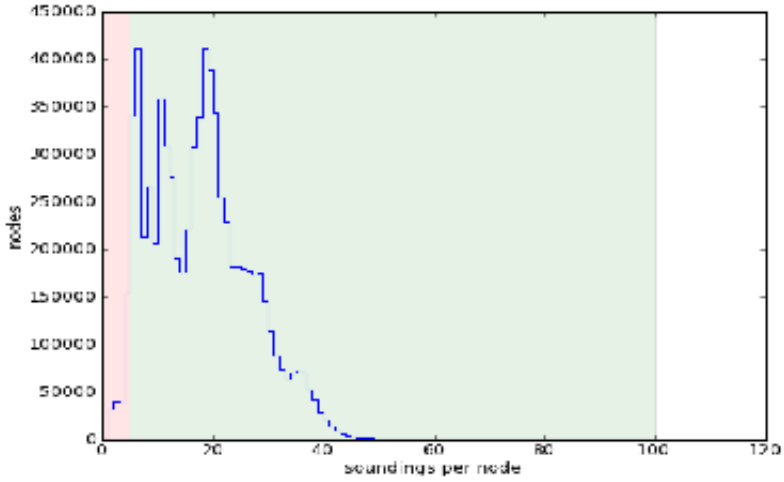
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (7460683/7460683).



Object Detection Coverage

96.45% | PASS

Nodes with 5 or more soundings **96.45%** (7195851/7460683).
Sounding count average is **17.23** soundings per node.
Sounding count mode is **7** soundings per node.



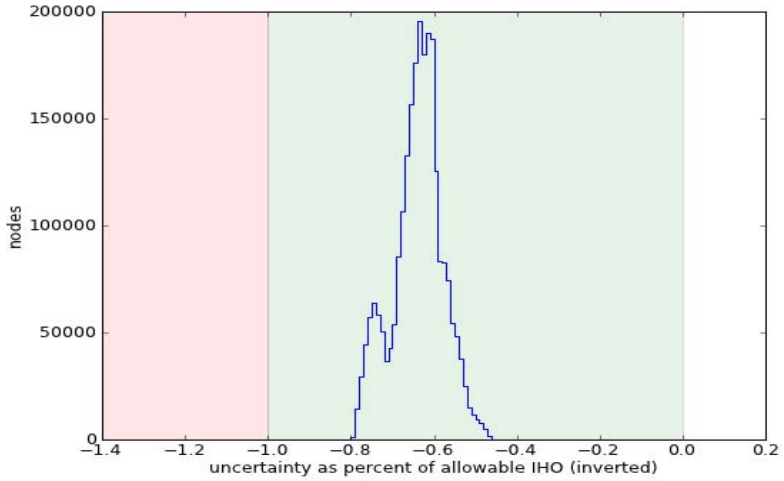
D00168_UTM05_4m_Final_36to80_Density_IHO

The finalized surface has 2446906 nodes with 36116810 soundings.

Uncertainty Standards

100.00% | PASS

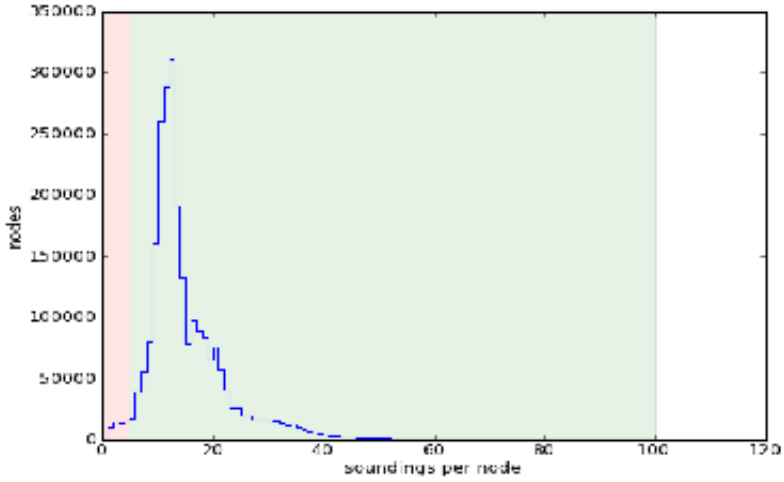
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (2446906/2446906).



Object Detection Coverage

97.87% | PASS

Nodes with 5 or more soundings **97.87%** (2394793/2446906).
Sounding count average is **14.76** soundings per node.
Sounding count mode is **13** soundings per node.



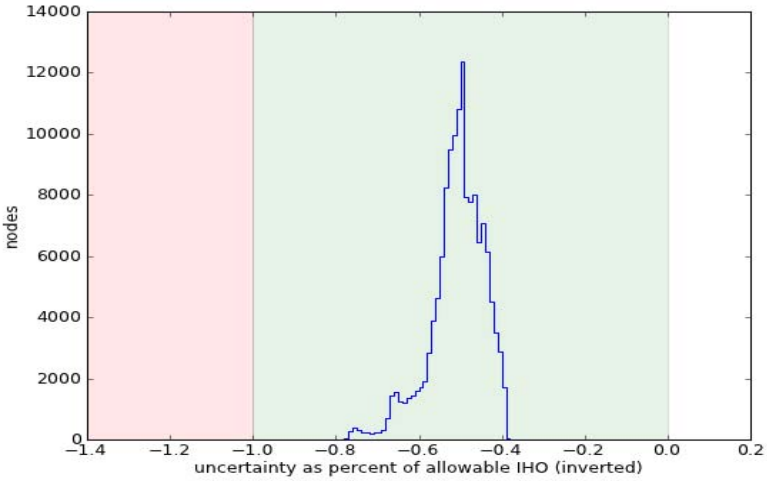
D00168_UTM05_8m_Final_72to100_Density_IHO

The finalized surface has 140859 nodes with 3728741 soundings.

Uncertainty Standards

100.00% | PASS

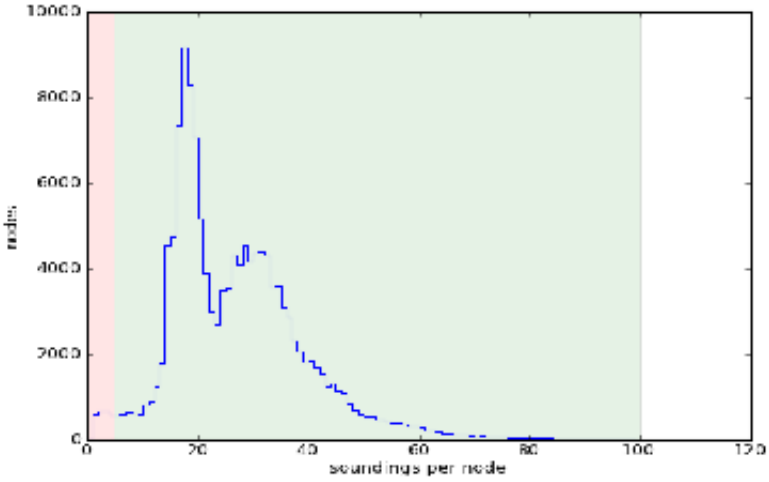
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (140859/140859).



Object Detection Coverage

98.23% | PASS

Nodes with 5 or more soundings **98.23%** (138370/140859).
Sounding count average is **26.47** soundings per node.
Sounding count mode is **18** soundings per node.



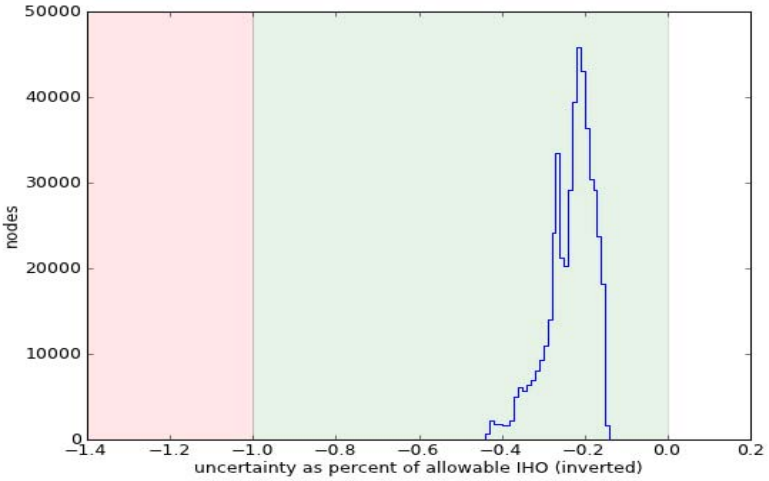
D00168_UTM05_8m_Final_100to160_Density_IHO

The finalized surface has 480751 nodes with 6187768 soundings.

Uncertainty Standards

100.00% | PASS

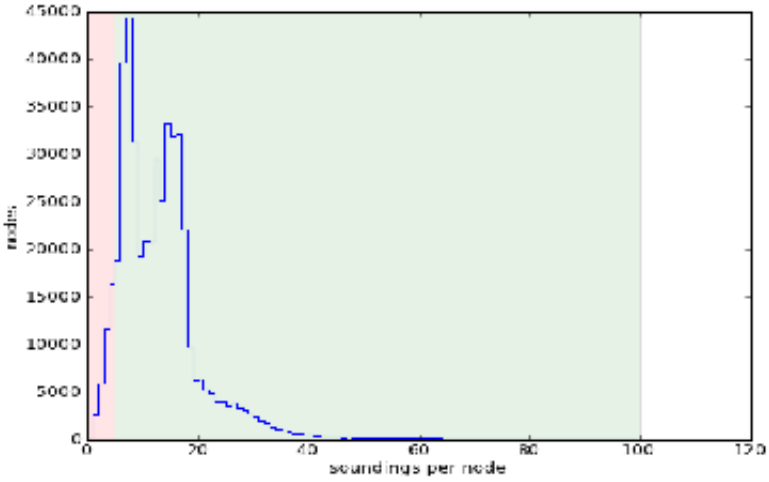
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (480751/480751).



Object Detection Coverage

92.40% | FAIL

Nodes with 5 or more soundings **92.40%** (444218/480751).
Sounding count average is **12.87** soundings per node.
Sounding count mode is **8** soundings per node.



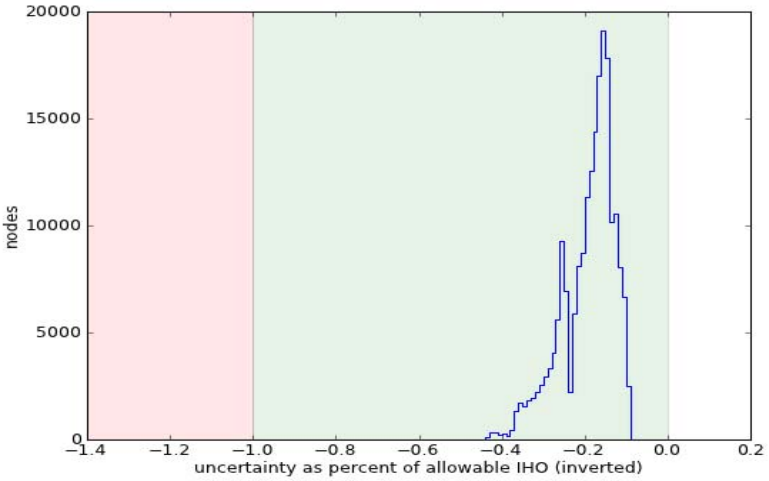
D00168_UTM05_16m_Final_144to320_Density_IHO

The finalized surface has 202387 nodes with 4484348 soundings.

Uncertainty Standards

100.00% | PASS

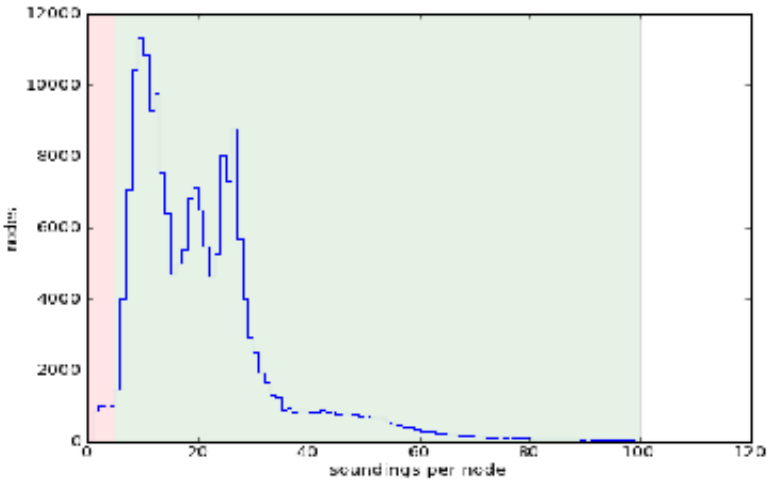
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (202387/202387).



Object Detection Coverage

98.11% | PASS

Nodes with 5 or more soundings **98.11%** (198552/202387).
Sounding count average is **22.16** soundings per node.
Sounding count mode is **10** soundings per node.



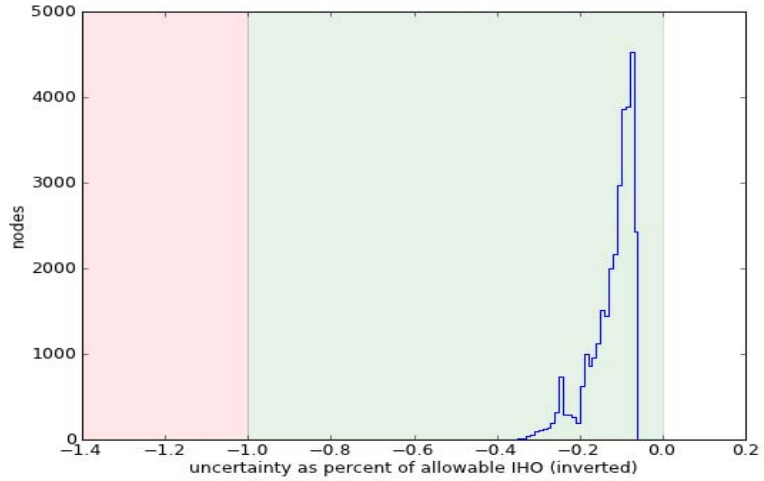
D00168_UTM05_32m_Final_288to1120_Density_IHO

The finalized surface has 32254 nodes with 682796 soundings.

Uncertainty Standards

100.00% | PASS

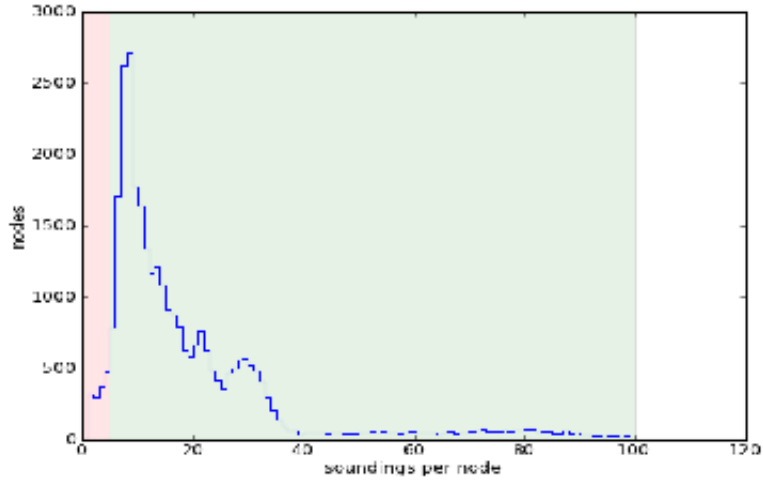
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (32254/32254).



Object Detection Coverage

95.45% | PASS

Nodes with 5 or more soundings **95.45%** (30785/32254).
Sounding count average is **21.17** soundings per node.
Sounding count mode is **9** soundings per node.



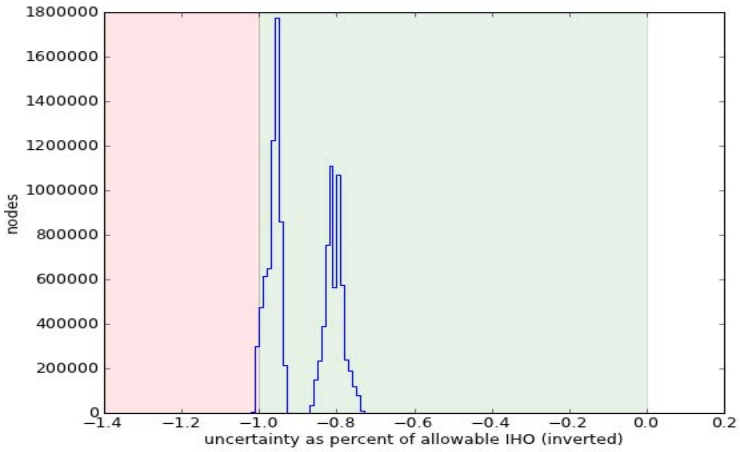
D00168_UTM04_1m_Final_0to20_Density_IHO

The finalized surface has 11648387 nodes with 442777163 soundings.

Uncertainty Standards

97.38% | PASS

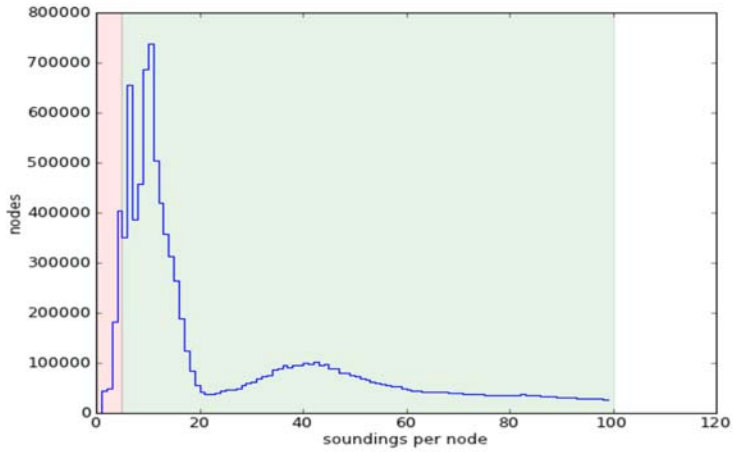
Nodes with Uncertainty less then or equal allowable IHO error **97.38%** (11343392/11648387).



Object Detection Coverage

94.14% | FAIL

Nodes with 5 or more soundings **94.14%** (10966256/11648387).
Sounding count average is **38.01** soundings per node.
Sounding count mode is **11** soundings per node.



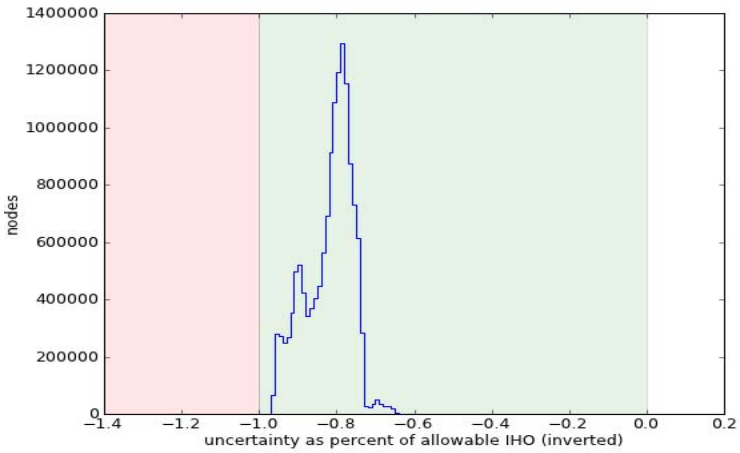
D00168_UTM04_2m_Final_18to40_Density_IHO

The finalized surface has 14146346 nodes with 152643074 soundings.

Uncertainty Standards

100.00% | PASS

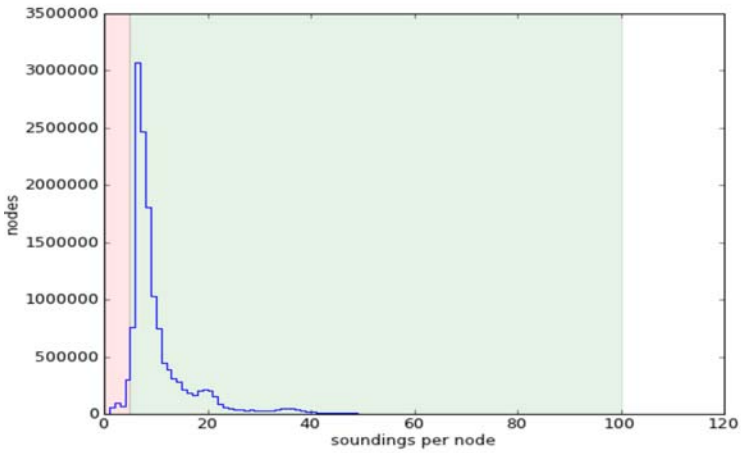
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (14146131/14146346).



Object Detection Coverage

96.34% | PASS

Nodes with 5 or more soundings **96.34%** (13628828/14146346).
Sounding count average is **10.79** soundings per node.
Sounding count mode is **7** soundings per node.



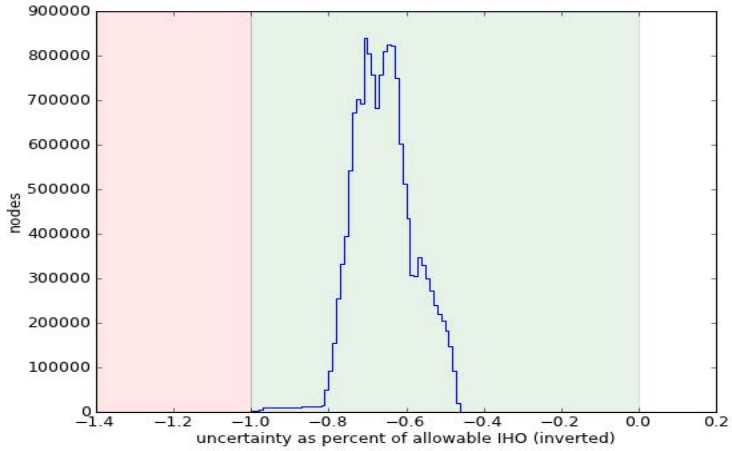
D00168_UTM04_4m_Final_36to80_Density_IHO

The finalized surface has 15637524 nodes with 287810028 soundings.

Uncertainty Standards

99.99% | PASS

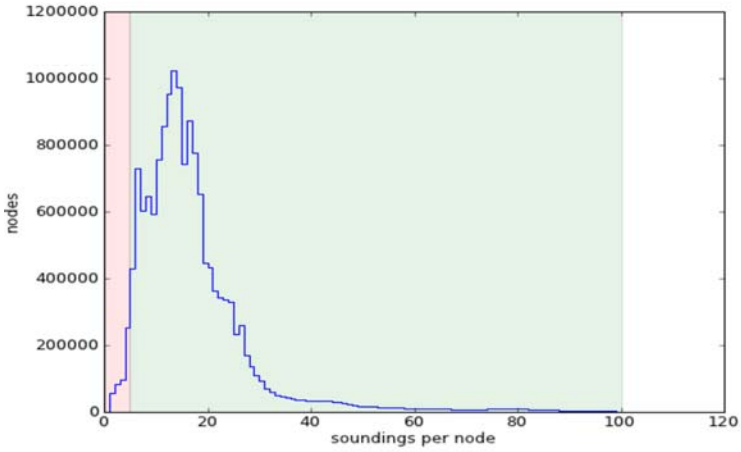
Nodes with Uncertainty less then or equal allowable IHO error **99.99%** (15635307/15637524).



Object Detection Coverage

96.87% | PASS

Nodes with 5 or more soundings **96.87%** (15147450/15637524).
Sounding count average is **18.41** soundings per node.
Sounding count mode is **14** soundings per node.



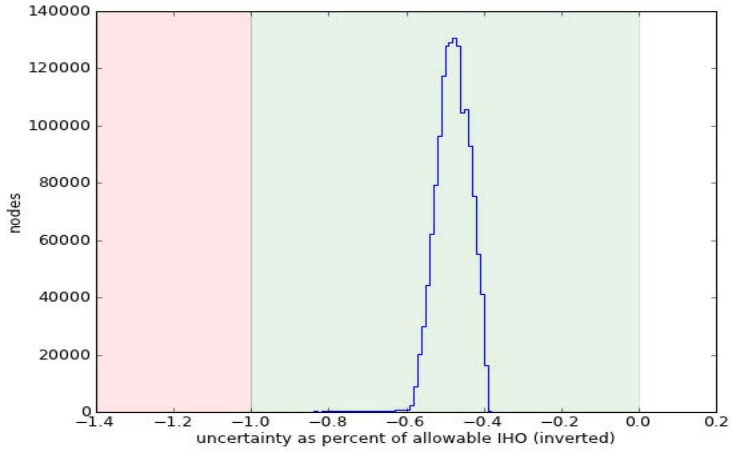
D00168_UTM04_8m_Final_72to100_Density_IHO

The finalized surface has 1480205 nodes with 35318144 soundings.

Uncertainty Standards

100.00% | PASS

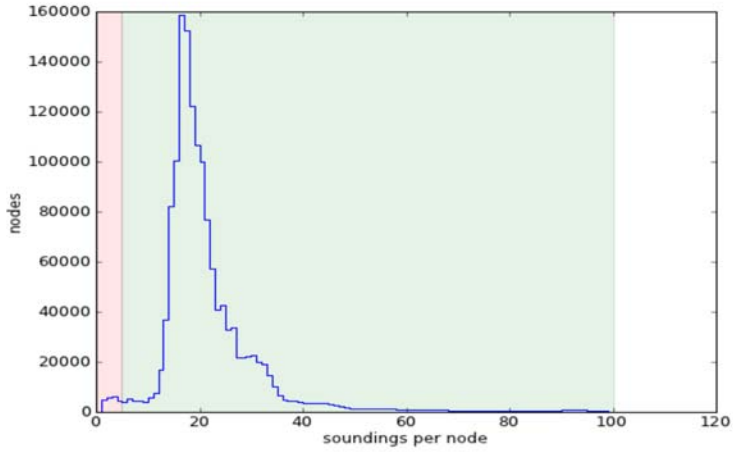
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (1480205/1480205).



Object Detection Coverage

98.56% | PASS

Nodes with 5 or more soundings **98.56%** (1458960/1480205).
Sounding count average is **23.86** soundings per node.
Sounding count mode is **17** soundings per node.



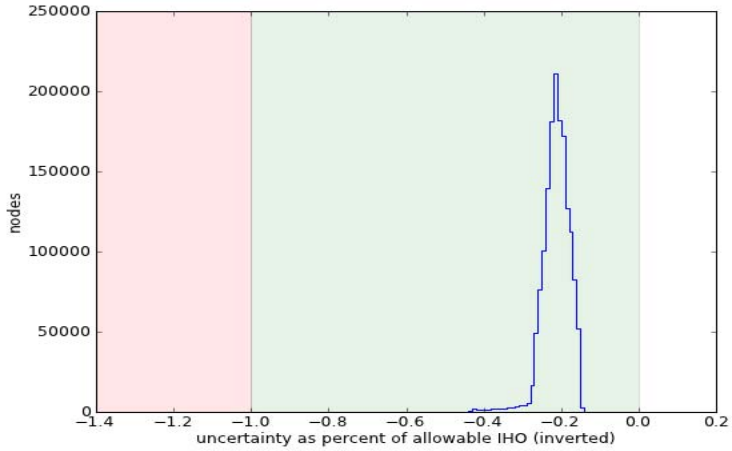
D00168_UTM04_8m_Final_100to160_Density_IHO

The finalized surface has 1548293 nodes with 19722690 soundings.

Uncertainty Standards

100.00% | PASS

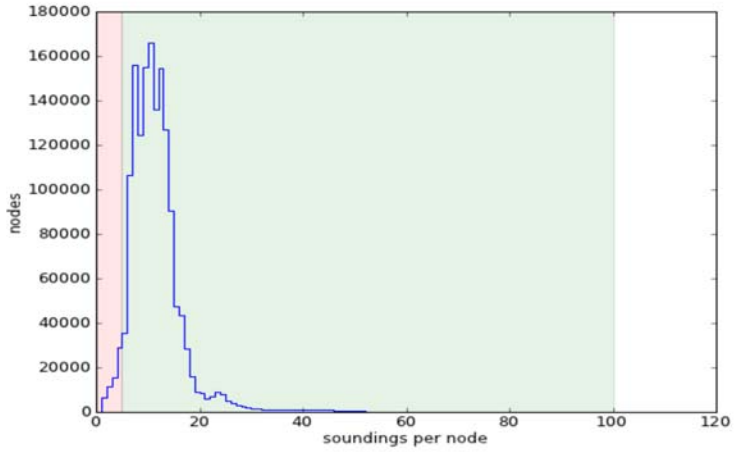
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (1548293/1548293).



Object Detection Coverage

95.95% | PASS

Nodes with 5 or more soundings **95.95%** (1485635/1548293).
Sounding count average is **12.74** soundings per node.
Sounding count mode is **11** soundings per node.



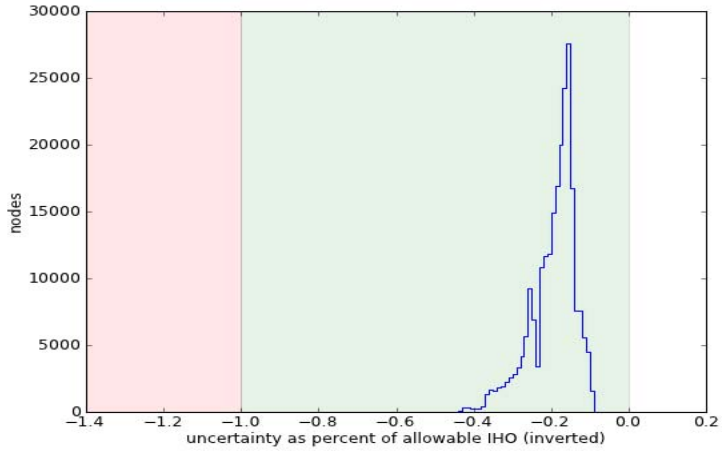
D00168_UTM04_16m_Final_144to320_Density_IHO

The finalized surface has 232263 nodes with 5577732 soundings.

Uncertainty Standards

100.00% | PASS

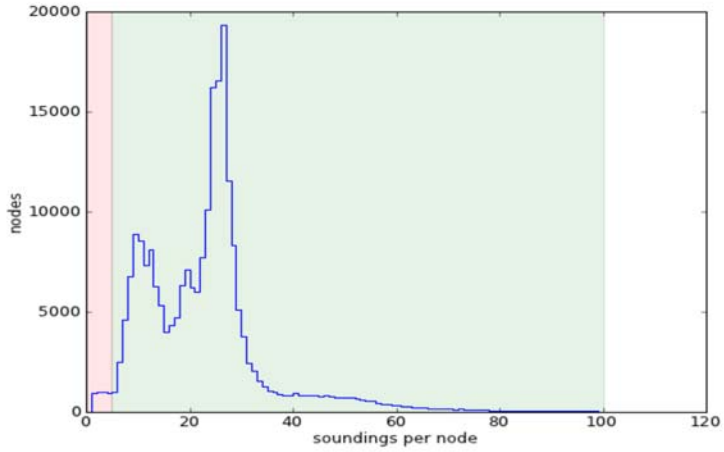
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (232263/232263).



Object Detection Coverage

98.34% | PASS

Nodes with 5 or more soundings **98.34%** (228397/232263).
Sounding count average is **24.01** soundings per node.
Sounding count mode is **27** soundings per node.



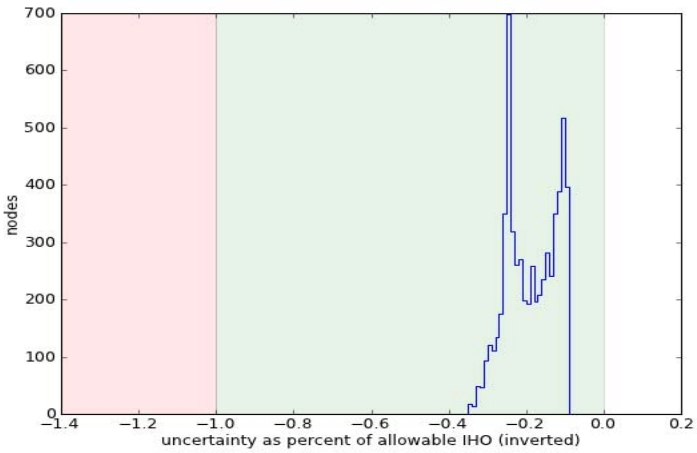
D00168_UTM04_32m_Final_288to1120_Density_IHO

The finalized surface has 6122 nodes with 280410 soundings.

Uncertainty Standards

100.00% | PASS

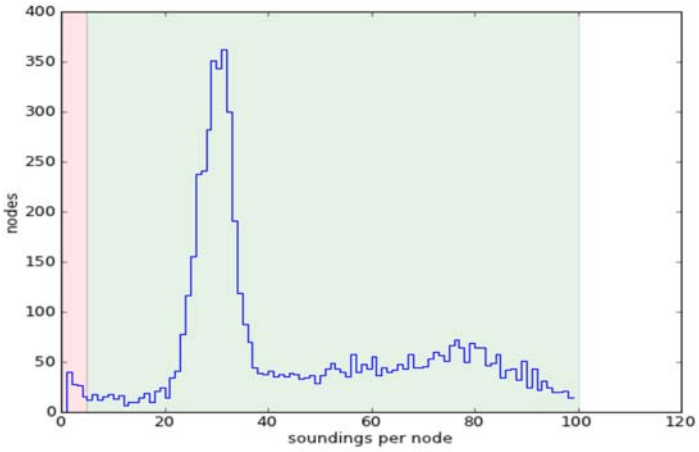
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (6122/6122).



Object Detection Coverage

98.19% | PASS

Nodes with 5 or more soundings **98.19%** (6011/6122).
Sounding count average is **45.80** soundings per node.
Sounding count mode is **32** soundings per node.



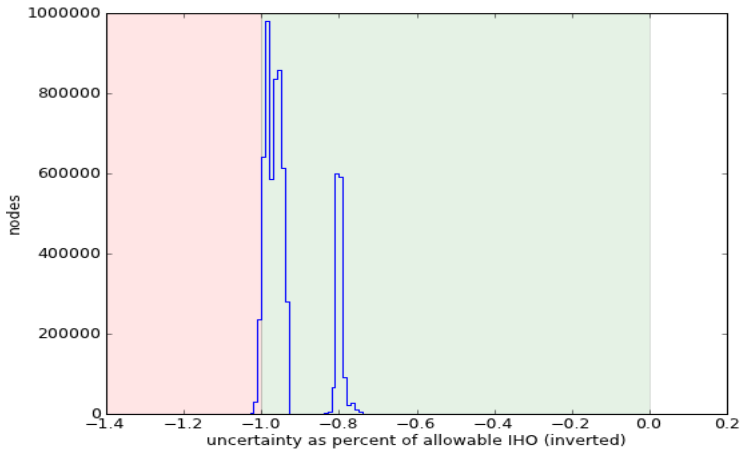
D00168_UTM03_Final_1m_0to20_Density_IHO

The finalized surface has 6488088 nodes with 232021827 soundings.

Uncertainty Standards

95.85% | PASS

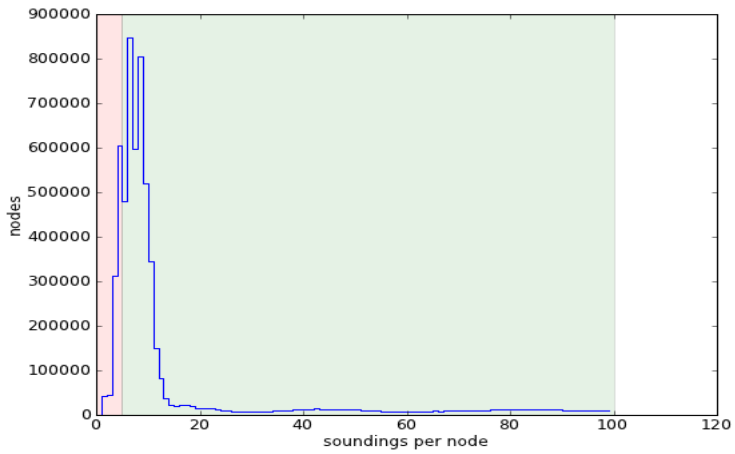
Nodes with Uncertainty less then or equal allowable IHO error **95.85%** (6218651/6488088).



Object Detection Coverage

84.50% | FAIL

Nodes with 5 or more soundings **84.50%** (5482177/6488088).
Sounding count average is **35.76** soundings per node.
Sounding count mode is **7** soundings per node.



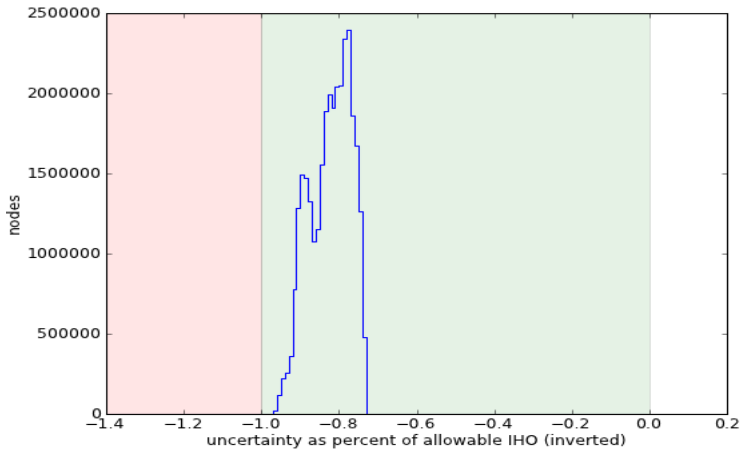
D00168_UTM03_Final_2m_18to40_Density_IHO

The finalized surface has 31007023 nodes with 257532856 soundings.

Uncertainty Standards

100.00% | PASS

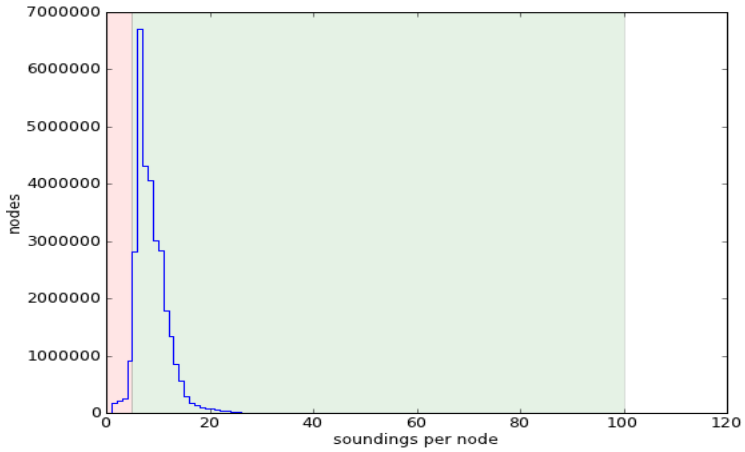
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (31007010/31007023).



Object Detection Coverage

94.99% | FAIL

Nodes with 5 or more soundings **94.99%** (29454454/31007023).
Sounding count average is **8.31** soundings per node.
Sounding count mode is **7** soundings per node.



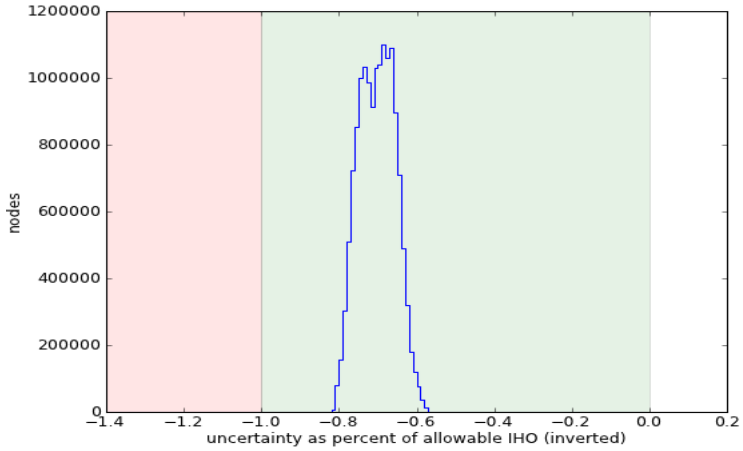
D00168_UTM03_Final_4m_36to85_Density_IHO

The finalized surface has 14734778 nodes with 277358535 soundings.

Uncertainty Standards

100.00% | PASS

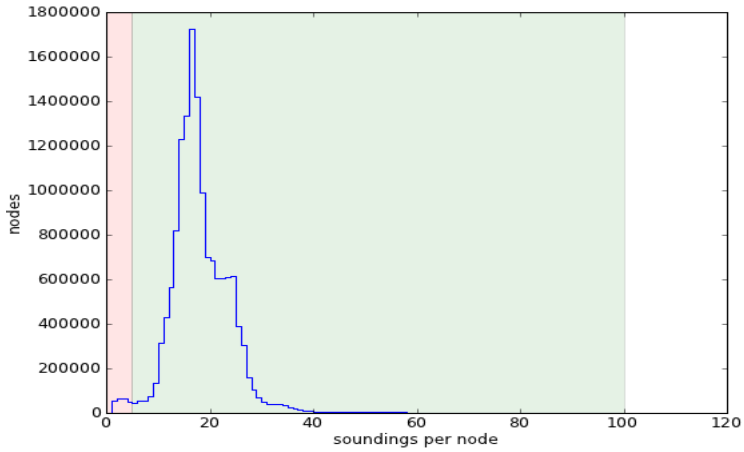
Nodes with Uncertainty less then or equal allowable IHO error **100.00%** (14734778/14734778).



Object Detection Coverage

98.36% | PASS

Nodes with 5 or more soundings **98.36%** (14493392/14734778).
Sounding count average is **18.82** soundings per node.
Sounding count mode is **17** soundings per node.



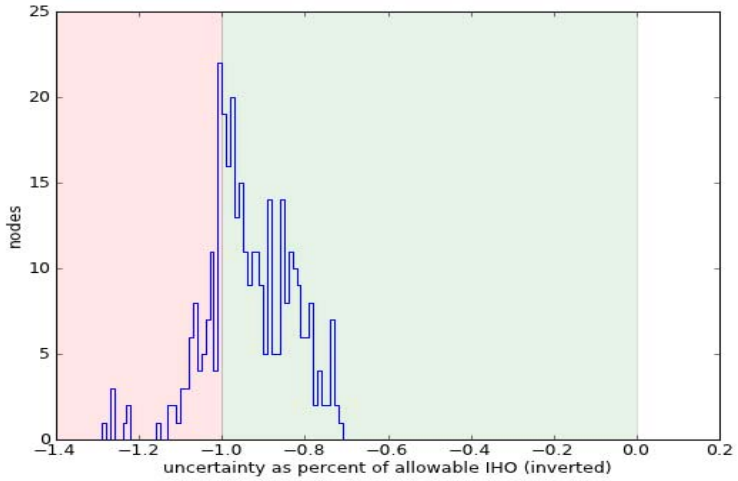
D00168_UTM02_2m_Final_18to40_Density_IHO

The finalized surface has 341 nodes with 1899 soundings.

Uncertainty Standards

74.78% | FAIL

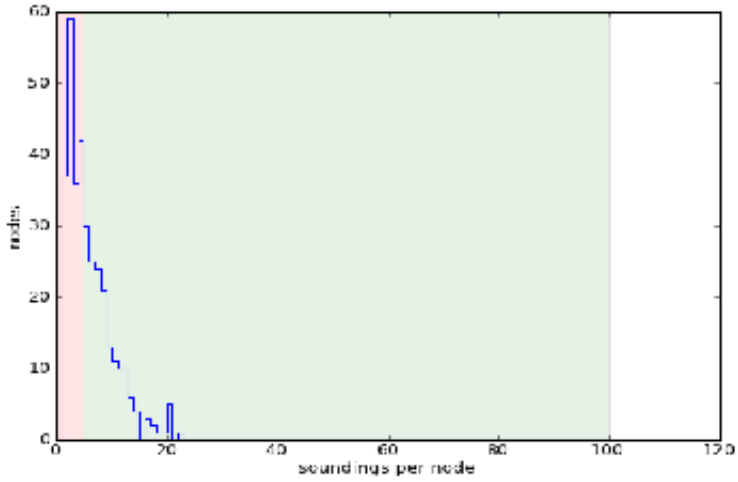
Nodes with Uncertainty less then or equal allowable IHO error **74.78%** (255/341).



Object Detection Coverage

48.97% | FAIL

Nodes with 5 or more soundings **48.97%** (167/341).
Sounding count average is **5.57** soundings per node.
Sounding count mode is **3** soundings per node.



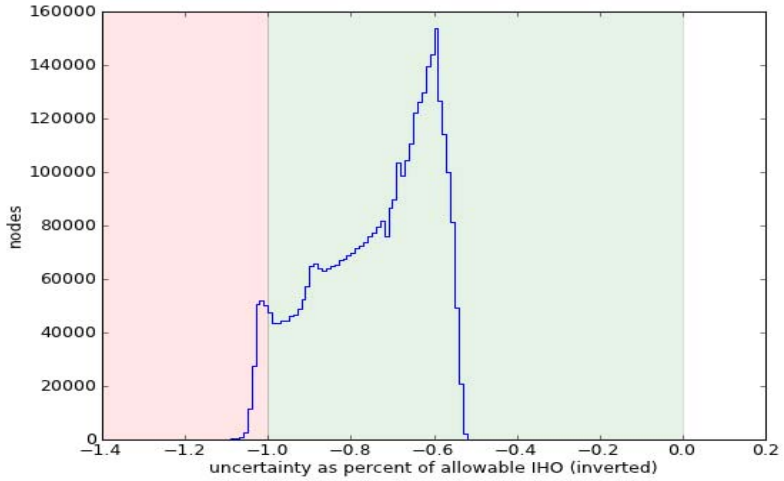
D00168_UTM02_4m_Final_36to80_Density_IHO

The finalized surface has 3911909 nodes with 71834639 soundings.

Uncertainty Standards

94.96% | FAIL

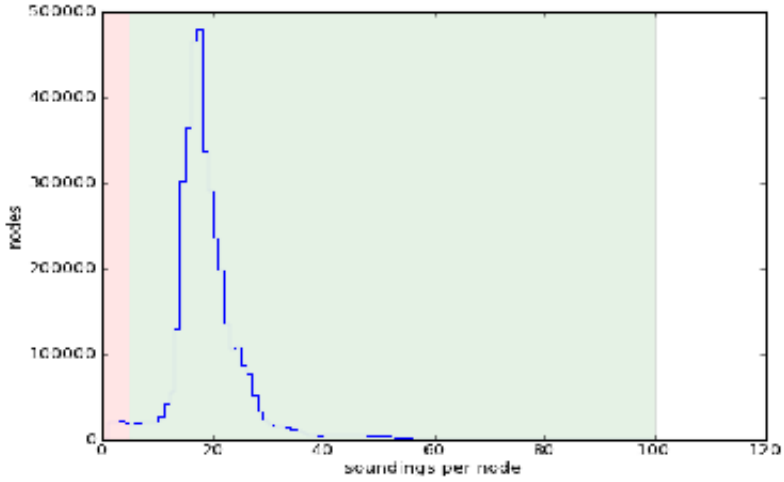
Nodes with Uncertainty less then or equal allowable IHO error **94.96%** (3714573/3911909).



Object Detection Coverage

97.88% | PASS

Nodes with 5 or more soundings **97.88%** (3828895/3911909).
Sounding count average is **18.36** soundings per node.
Sounding count mode is **18** soundings per node.



APPROVAL PAGE

D00168

Data partially meet 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 specific areas as delineated during office processing.

The following products will be sent to NGDC for archive:

- D00168_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- D00168_GeoImage.pdf

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

Digitally signed by HOLMBERG.PETER.SCOTT.1365886101
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOLMBERG.PETER.SCOTT.1365886101
Date: 2013.07.25 15:28:59 -07'00'

Approved:_____

Peter Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch

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

David Zezula
2013.07.26 08:45:01 -07'00'

Approved:_____

CDR David Zezula, NOAA
Chief, Pacific Hydrographic Branch