

F00648

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

DESCRIPTIVE REPORT

Type of Survey: Basic Hydrographic Survey Navigable Area Field Examination Debris Mapping Support USCG

Registry Number: F00648

LOCALITY

State(s): Alaska

General Locality: Kodiak, AK

Sub-locality: Womens Bay

2014

CHIEF OF PARTY
CDR David J. Zezula, NOAA

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00648

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: **Kodiak, AK**

Sub-Locality: **Womens Bay**

Scale: **5000**

Dates of Survey: **08/11/2014 to 08/18/2014**

Instructions Dated: **04/21/2014**

Project Number: **OPR-P335-FA-14**

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

Chief of Party: **CDR David J. Zezula, NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

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. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold, red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <http://www.ncei.noaa.gov/>.

Table of Contents

A. Area Surveyed	1
A.1 Survey Limits	1
A.2 Survey Purpose	1
A.3 Survey Quality	1
A.4 Survey Coverage	2
A.5 Survey Statistics	2
B. Data Acquisition and Processing	4
B.1 Equipment and Vessels	4
B.1.1 Vessels	4
B.1.2 Equipment	5
B.2 Quality Control	5
B.2.1 Crosslines	5
B.2.2 Uncertainty	7
B.2.3 Junctions	8
B.2.4 Sonar QC Checks	8
B.2.5 Equipment Effectiveness	8
B.2.6 Factors Affecting Soundings	8
B.2.7 Sound Speed Methods	12
B.2.8 Coverage Equipment and Methods	13
B.2.9 IHO Uncertainty	13
B.2.10 Density	14
B.2.11 Holidays	15
B.3 Echo Sounding Corrections	16
B.3.1 Corrections to Echo Soundings	16
B.3.2 Calibrations	16
B.4 Backscatter	16
B.5 Data Processing	16
B.5.1 Software Updates	16
B.5.2 Surfaces	17
B.5.3 Data Logs	17
B.5.4 Critical Soundings	17
C. Vertical and Horizontal Control	18
C.1 Vertical Control	18
C.2 Horizontal Control	19
D. Results and Recommendations	20
D.1 Chart Comparison	20
D.1.1 Raster Charts	20
D.1.2 Electronic Navigational Charts	25
D.1.3 AWOIS Items	25
D.1.4 Maritime Boundary Points	25
D.1.5 Charted Features	25
D.1.6 Uncharted Features	25
D.1.7 Dangers to Navigation	28

D.1.8 Shoal and Hazardous Features	28
D.1.9 Channels	28
D.1.10 Bottom Samples	29
D.2 Additional Results	29
D.2.1 Shoreline	29
D.2.2 Prior Surveys	29
D.2.3 Aids to Navigation	29
D.2.4 Overhead Features	29
D.2.5 Submarine Features	29
D.2.6 Ferry Routes and Terminals	29
D.2.7 Platforms	29
D.2.8 Significant Features	30
D.2.9 Construction and Dredging	30
D.2.10 New Survey Recommendation	30
D.2.11 Inset Recommendation	31
E. Approval Sheet	32
F. Table of Acronyms	33

List of Tables

Table 1: Survey Limits	1
Table 2: Hydrographic Survey Statistics	3
Table 3: Dates of Hydrography	4
Table 4: Vessels Used	4
Table 5: Major Systems Used	5
Table 6: Survey Specific Tide TPU Values	7
Table 7: Survey Specific Sound Speed TPU Values	8
Table 8: Software Updates	16
Table 9: Submitted Surfaces	17
Table 10: NWLON Tide Stations	18
Table 11: Water Level Files (.tid)	18
Table 12: Tide Correctors (.zdf or .tc)	18
Table 13: CORS Base Stations	19
Table 14: USCG DGPS Stations	20
Table 15: Largest Scale Raster Charts	20
Table 16: Largest Scale ENCs	25

List of Figures

Figure 1: F00648 Survey Outline	2
Figure 2: Crossline Comparison Statistics	6
Figure 3: Crossline Differencing gaps due to "frowning" data	7
Figure 4: Additional computation	9
Figure 5: Before Additional computation	10

Figure 6: Sound Velocity Artifacts.....	11
Figure 7: Sound Velocity Artifacts.....	12
Figure 8: Sound Velocity CTD casts.....	13
Figure 9: IHO Uncertainty Layer.....	14
Figure 10: Fairweather Docked on the Pier.....	15
Figure 11: Disagreement between chart Submerged Pilings and surveyed soundings.....	21
Figure 12: Contour Disagreements Northwest.....	22
Figure 13: Contour Disagreements Southwest.....	23
Figure 14: Contour Channel Agreements.....	24
Figure 15: Gangway next to pier.....	26
Figure 16: Gangway in 3d surface display.....	27
Figure 17: Gangway rail from Dive Ops.....	28
Figure 18: Dredging Scars.....	30

Descriptive Report to Accompany Survey F00648

Project: OPR-P335-FA-14

Locality: Kodiak, AK

Sublocality: Womens Bay

Scale: 1:5000

August 2014 - August 2014

NOAA Ship *Fairweather*

Chief of Party: CDR David J. Zezula, NOAA

A. Area Surveyed

The survey area is located in Kodiak Harbor, within the sub-locality of Womens Bay.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
57° 44' 23.91" N 152° 33' 9.61" W	57° 42' 39.78" N 152° 27' 37.59" 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 field examination is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. The survey includes the Coast Guard piers, Shannon Point, Bell Flats Highway, and the Womens Bay channel. This area is a high density traffic area, frequently transited by large Coast Guard and NOAA ships.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

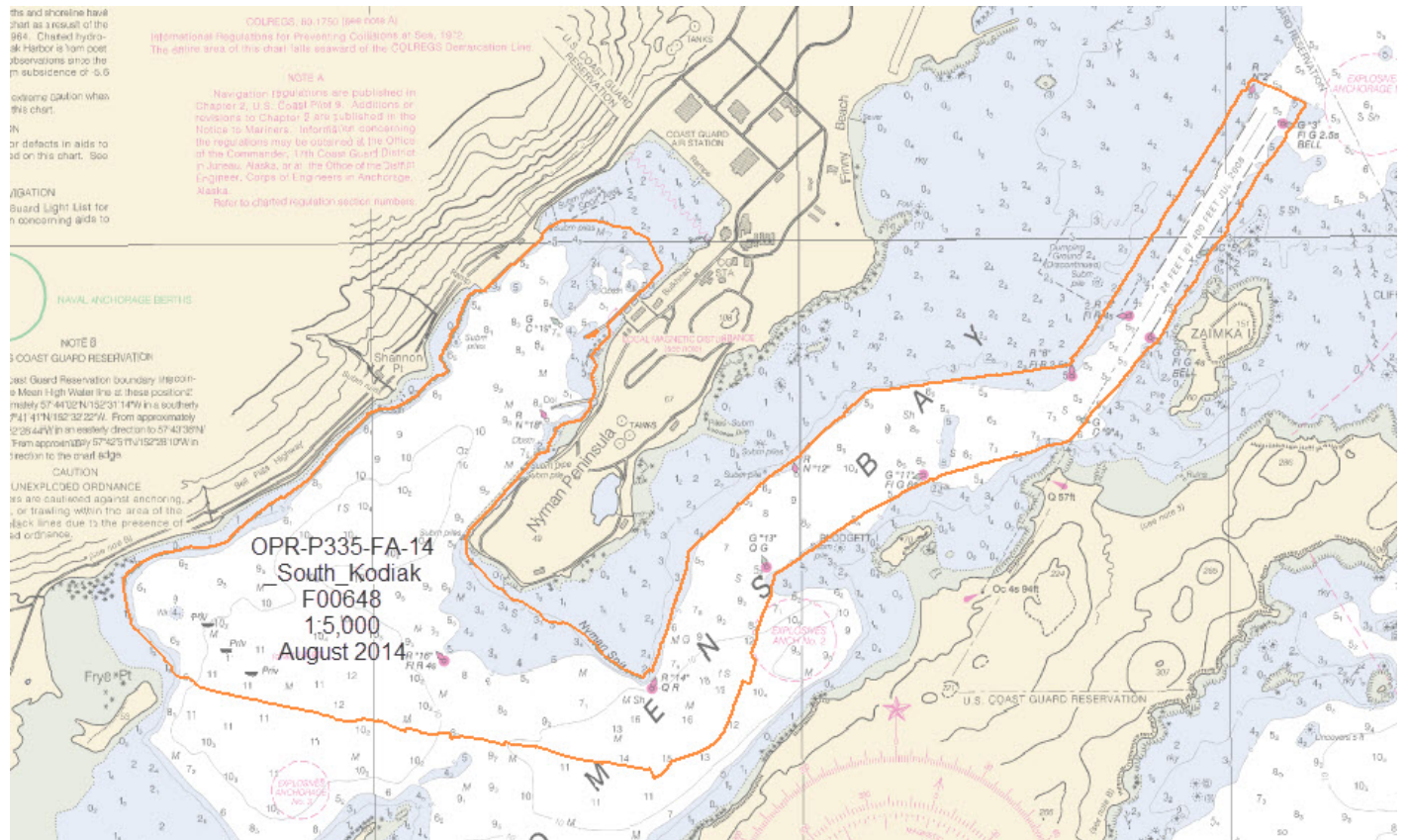


Figure 1: F00648 Survey Outline

Survey Coverage was in accordance with the requirements in the Project Instructions and NOS Hydrographic Surveys Specifications and Deliverables, dated April 2014.

A.5 Survey Statistics

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

	HULL ID	<i>2806</i>	<i>2808</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0	0
	MBES Mainscheme	8.85	61.71	70.56
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	6.54	0	6.54
	Lidar Crosslines	0	0	0
Number of Bottom Samples				0
Number of AWOIS Items Investigated				0
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				1
Total SNM				1.29

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/11/2014	223
08/12/2014	224
08/13/2014	225
08/14/2014	226
08/15/2014	227
08/18/2014	230

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:

Hull ID	2808	2806
LOA	8.64 meters	8.64 meters
Draft	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	SVP71	Sound Speed System
Sea-Bird	SBE 19plus	Conductivity, Temperature, and Depth Sensor
Applanix	POS/MV V4	Positioning and Attitude System
RESON	7125	MBES

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 9% of mainscheme acquisition.

Crosslines were collected, processed, and compared in accordance with section 5.2.4.3 of the HSSD. Surface differencing in CARIS Bathymetry Data Base was used to assess crossline agreement with main scheme lines. This difference surface is submitted digitally in the Separates II folder. The two surfaces agree within plus or minus 0.14m at the 95% confidence level, therefore crosslines agree with main scheme lines within the total allowable vertical and horizontal uncertainty in their common areas. The only areas where there are crosslines, but a differencing surface gap, are areas where sound speed spikes were deleted due to "frowning" data which pulled the surface down, and crosslines data was used to fill in the gaps of the surface as shown in image below (Crossline Differencing gaps due to "frowning" data). The survey met the percentage requirements for crosslines, but did not collect any crosslines in the Womens Bay entrance Channel due to the small width of the channel and vessel traffic.

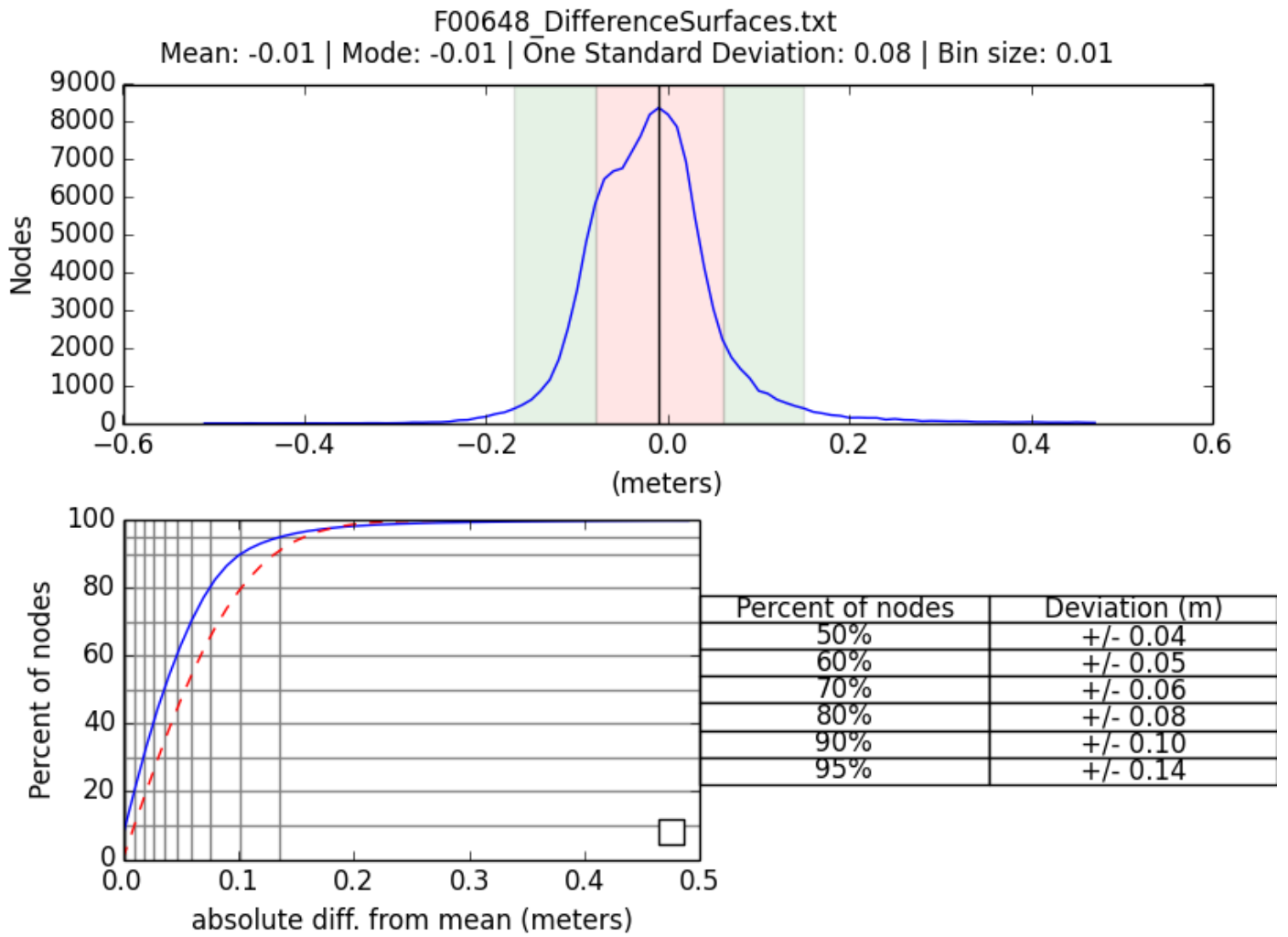


Figure 2: Crossline Comparison Statistics

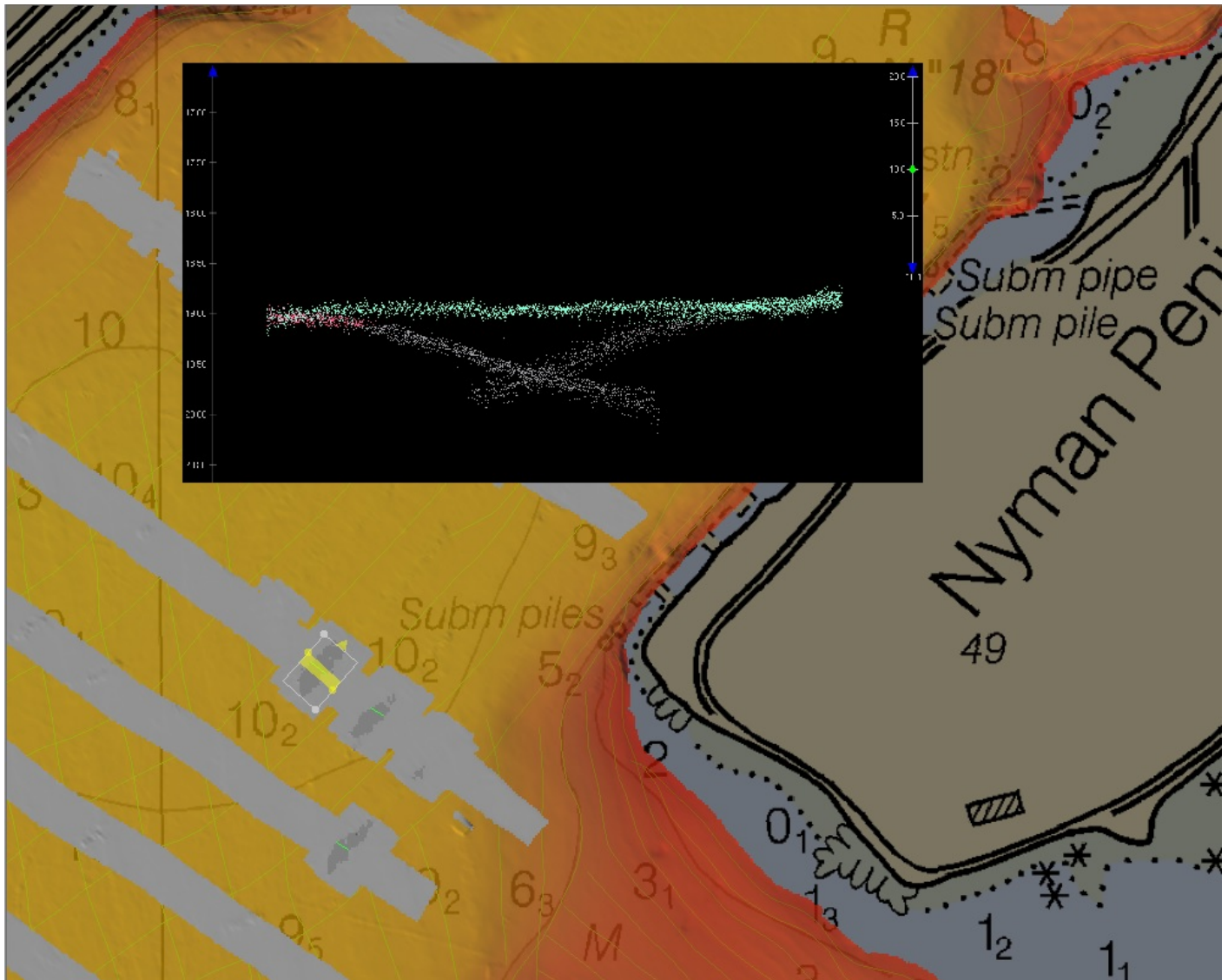


Figure 3: Crossline Differencing gaps due to "frowning" data

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.01 meters	0.06 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
2806	2 meters/second		0.5 meters/second
2808	2 meters/second		0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

B.2.3 Junctions

Junction surveys exist for this survey but were not examined.

There are no contemporary surveys that junction with this survey.

The statement "There are no contemporary surveys that junction with this survey." is an error in the xml document and does not apply to this survey. Survey F00648 junctions with F00558 (2008) which has already been applied to the applicable charts.

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

Sound Speed Artifacts

Several days of acquisition occurred during heavy rains which resulted in sound speed artifacts. The most severe artifacts appear in an area where there is an out flow of fresh water from a stream of freshwater runoff southeast of Shannon point. The MBES data were reviewed in CARIS Subset Mode with appropriate reference surfaces. The problem was discovered early and cast frequency was increased from every four hours to every one or two hours. Processing an additional interpolated recomputation of the steered beam angles from the sound velocity profile was done for the worst days, day numbers 223-227. The images below are done before and after the additional interpolated recomputation. Figure 8 and 9 are images from after the additional computation, with and without rejected data.

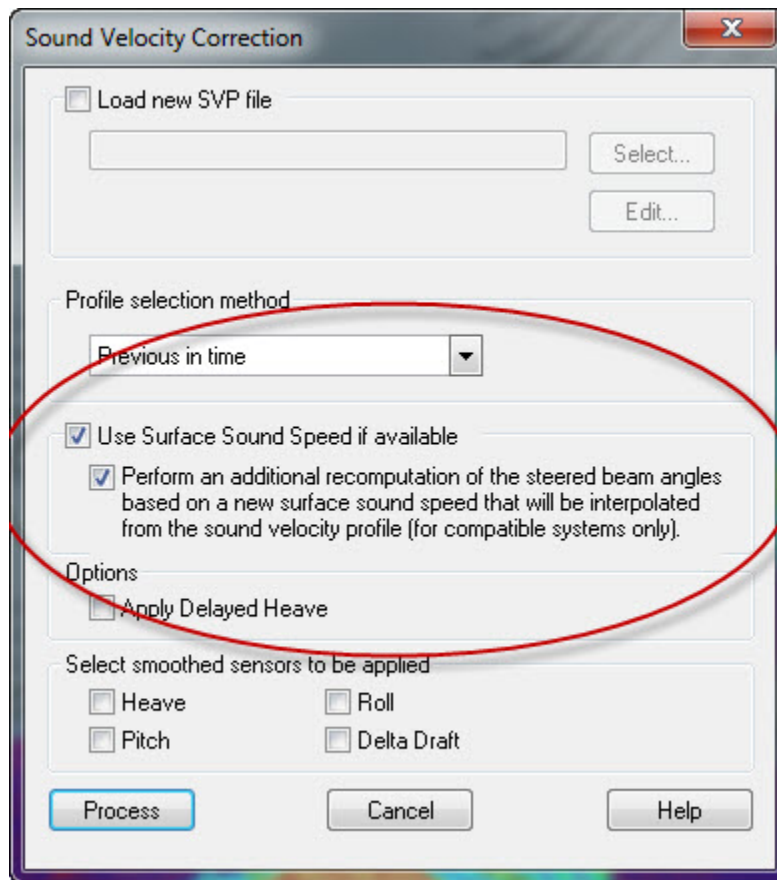


Figure 4: Additional computation

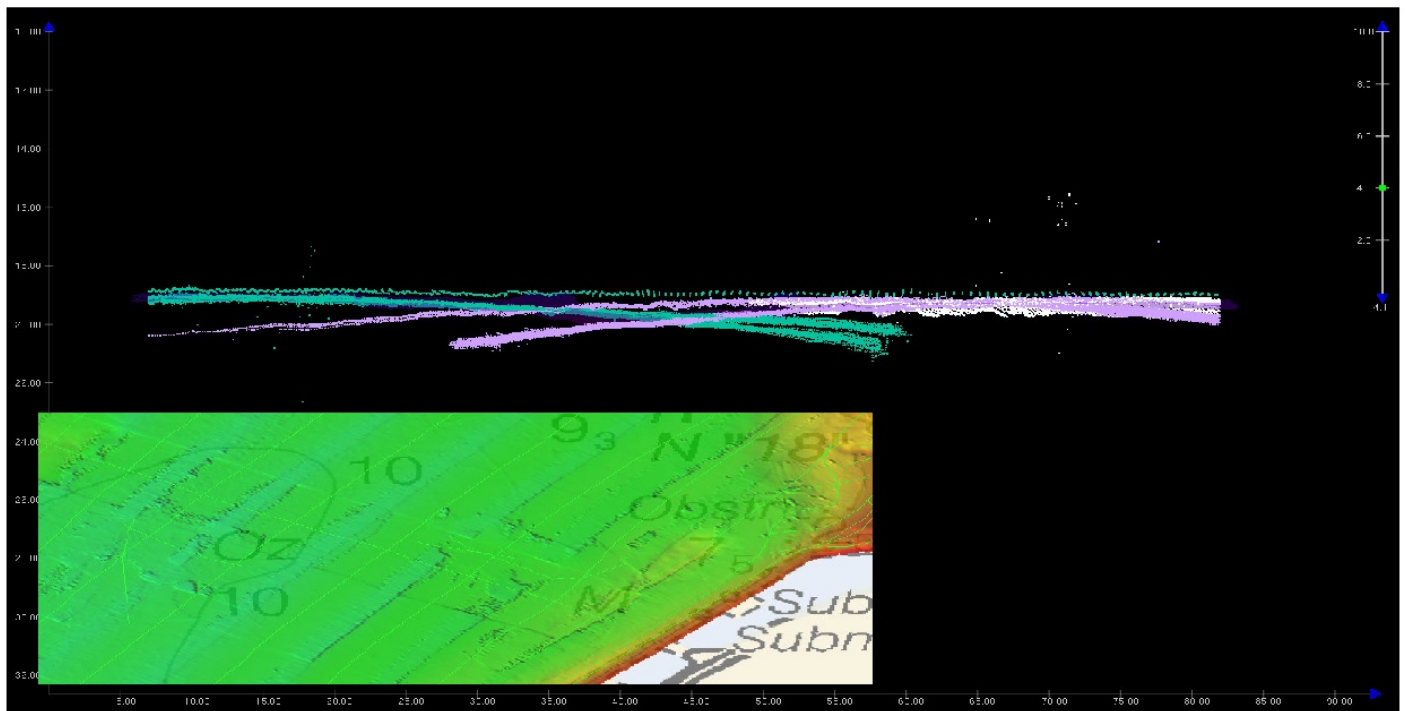


Figure 5: Before Additional computation

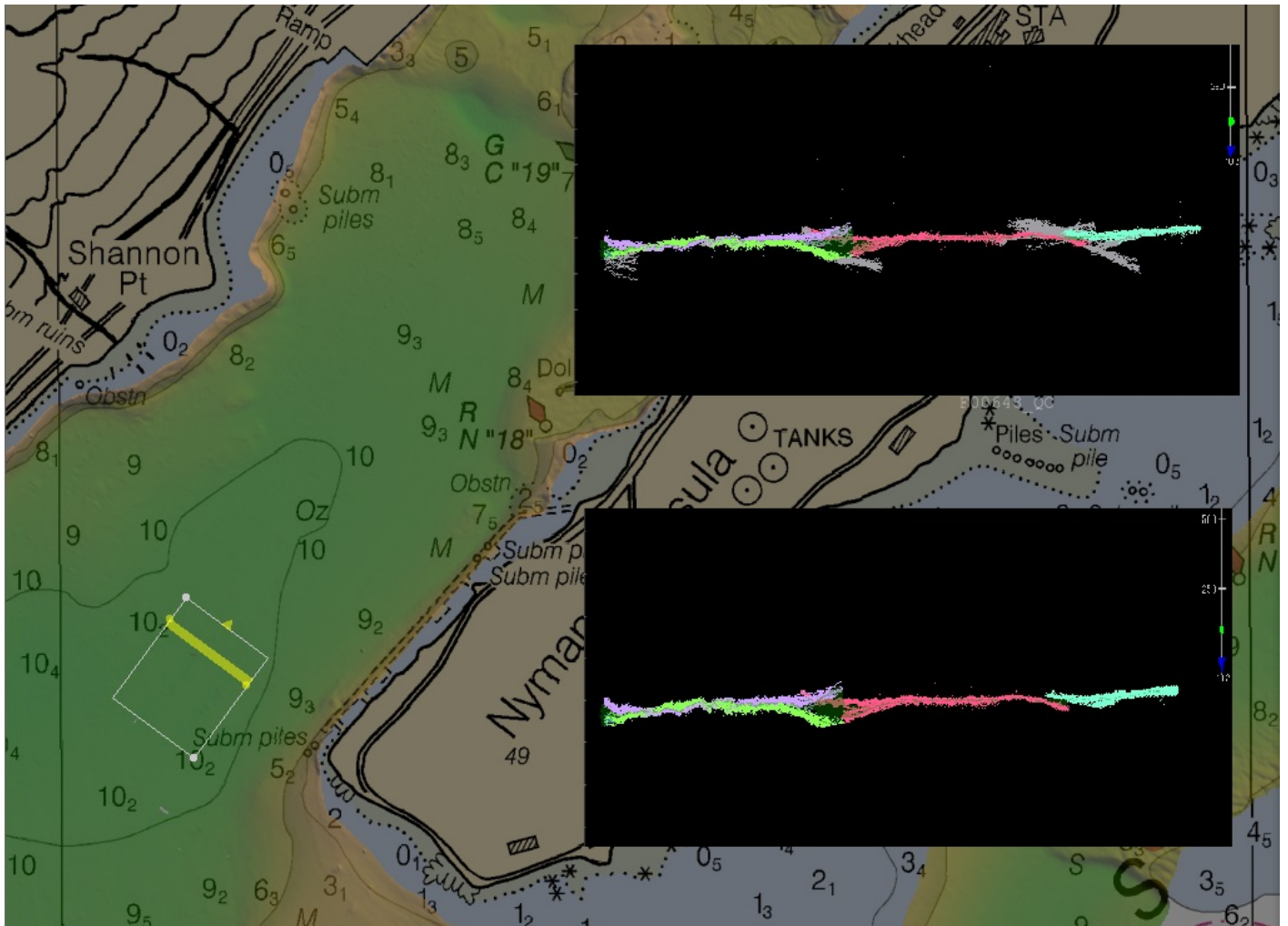


Figure 6: Sound Velocity Artifacts

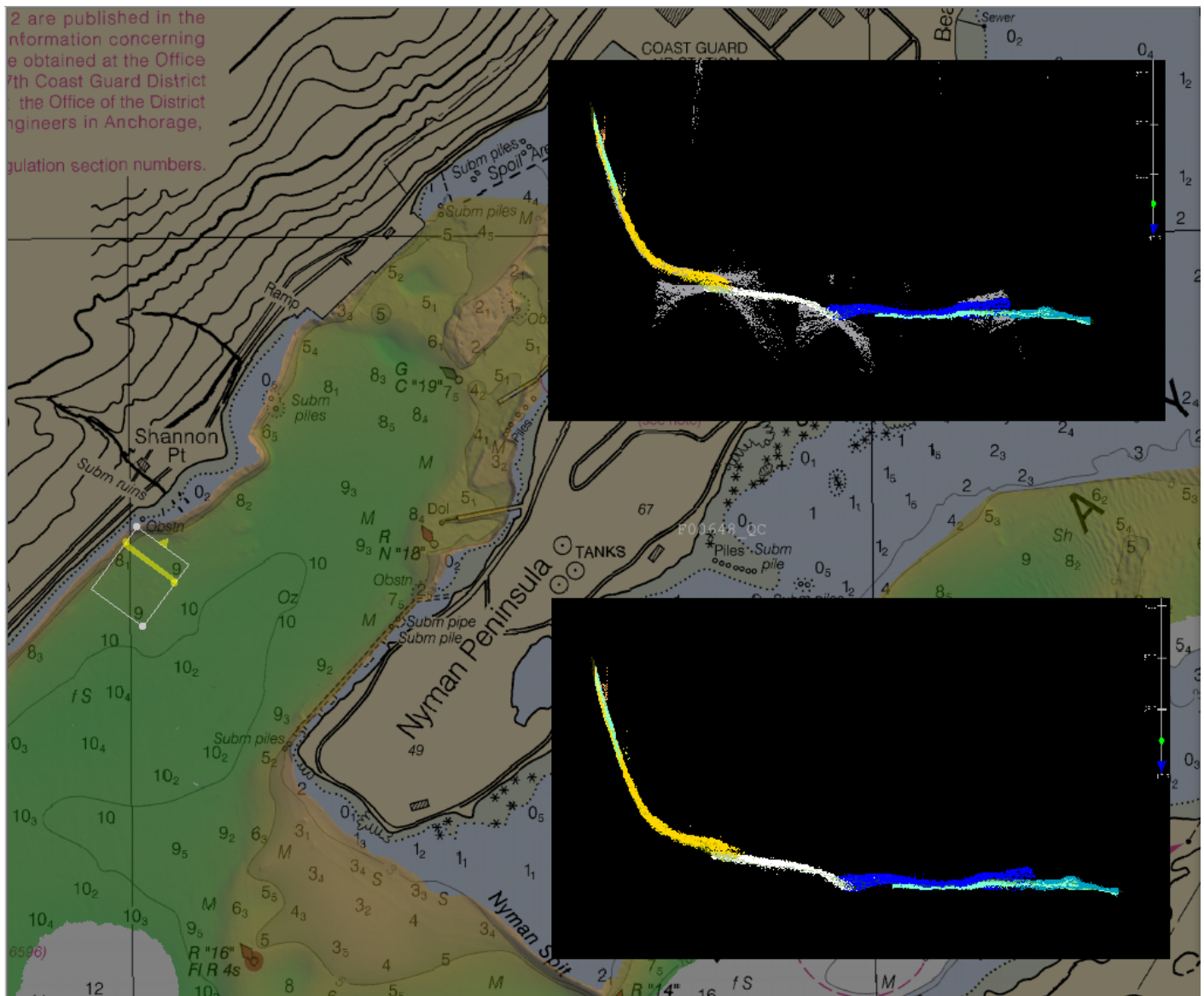


Figure 7: Sound Velocity Artifacts

It should be noted that Figure 4 is an example for the 'Use Surface Sound Speed' check box and is not an indication of profile selection method used. There are also roll errors that are evident in the submitted BASE surfaces. They have been examined by the reviewer and were found to be within specifications.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: During launch acquisition casts were conducted more frequently due to sound speed artifacts, about every 2 hours, except for Day Number 230 when DQA tests passed every cast.

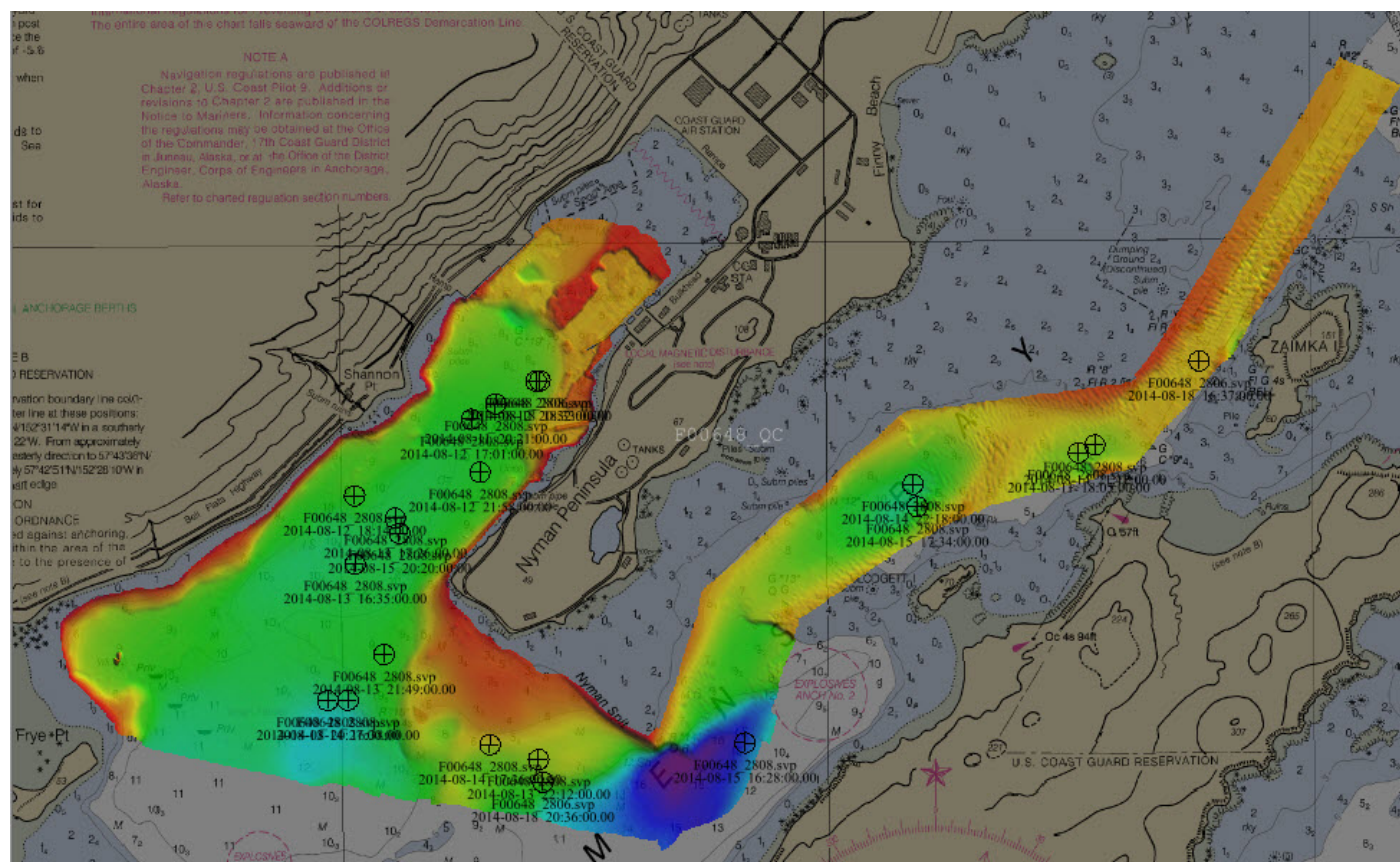


Figure 8: Sound Velocity CTD casts

B.2.8 Coverage Equipment and Methods

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

B.2.9 IHO Uncertainty

All data meet the data accuracy specifications as stated in the NOS Hydrographic Surveys Specifications and Deliverables (HSSD) dated April 2014. It was found that 100% of nodes in the 1-meter, and 2-meter grids meet or exceed IHO Order 1 specifications for all depths of survey F00648, see Standards Compliance Review in Appendix II. To assess vertical accuracy standards, a child layer titled "IHO_1" was created for each of the 1-meter, and 2-meter finalized surfaces using the equations stated in section C. 2.1 of the DAPR.

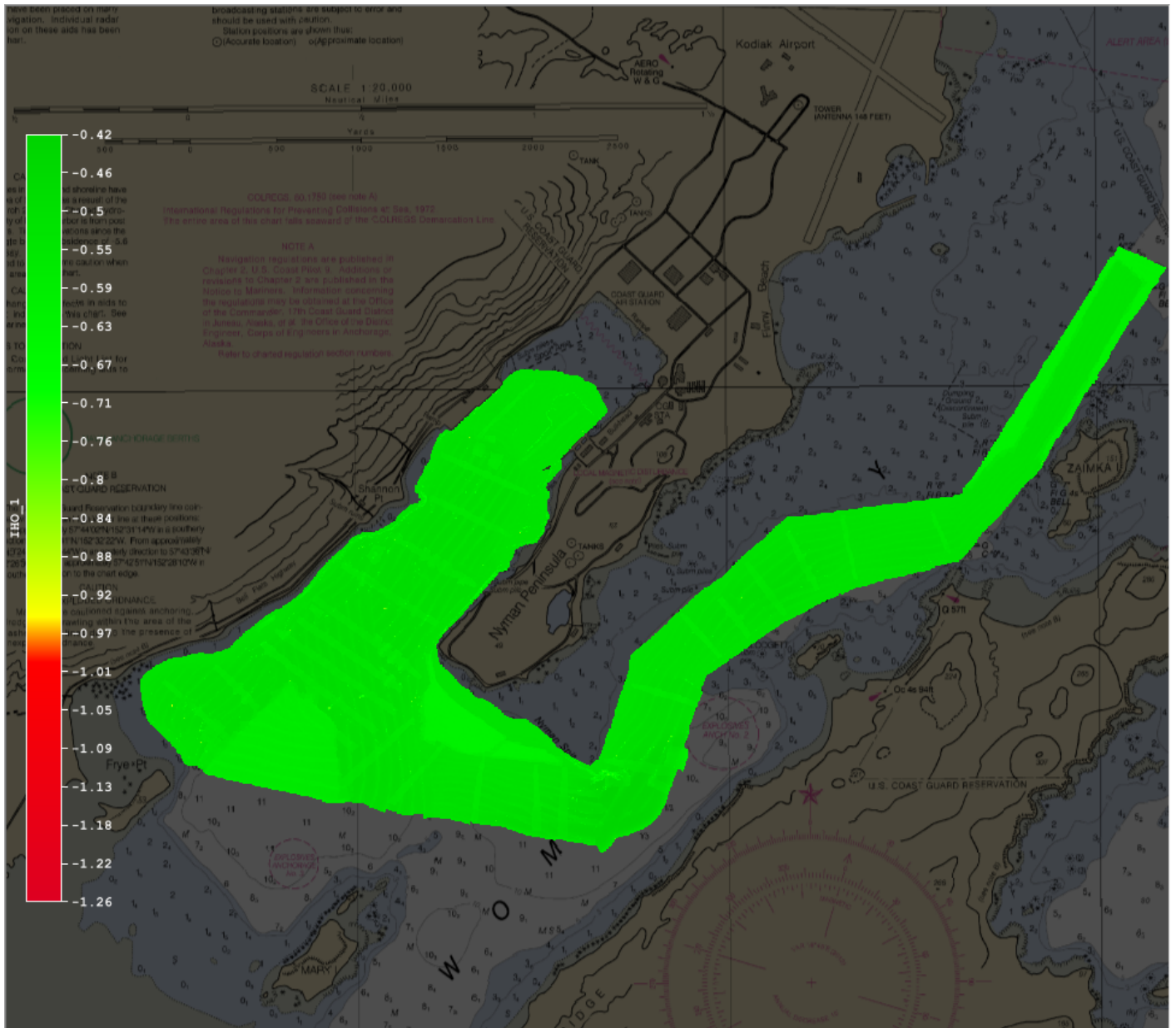


Figure 9: IHO Uncertainty Layer

A Standards Compliance Review was not included in Appendix II. 99.9% of the nodes in the 1- meter finalized BASE surface meet TVU specifications.

B.2.10 Density

Density requirements for F00648 were achieved with at least 99.94% of finalized surface nodes containing five or more soundings, see Standards Compliance Review in Appendix II.

A Standards Compliance Review was not included in Appendix II. 99.9% of the nodes in both the 1- meter and 2-meter finalized BASE surfaces meet density specifications.

B.2.11 Holidays

The only Holiday on F00648 is where NOAA ship *Fairweather* was docked on the Coast Guard Pier.

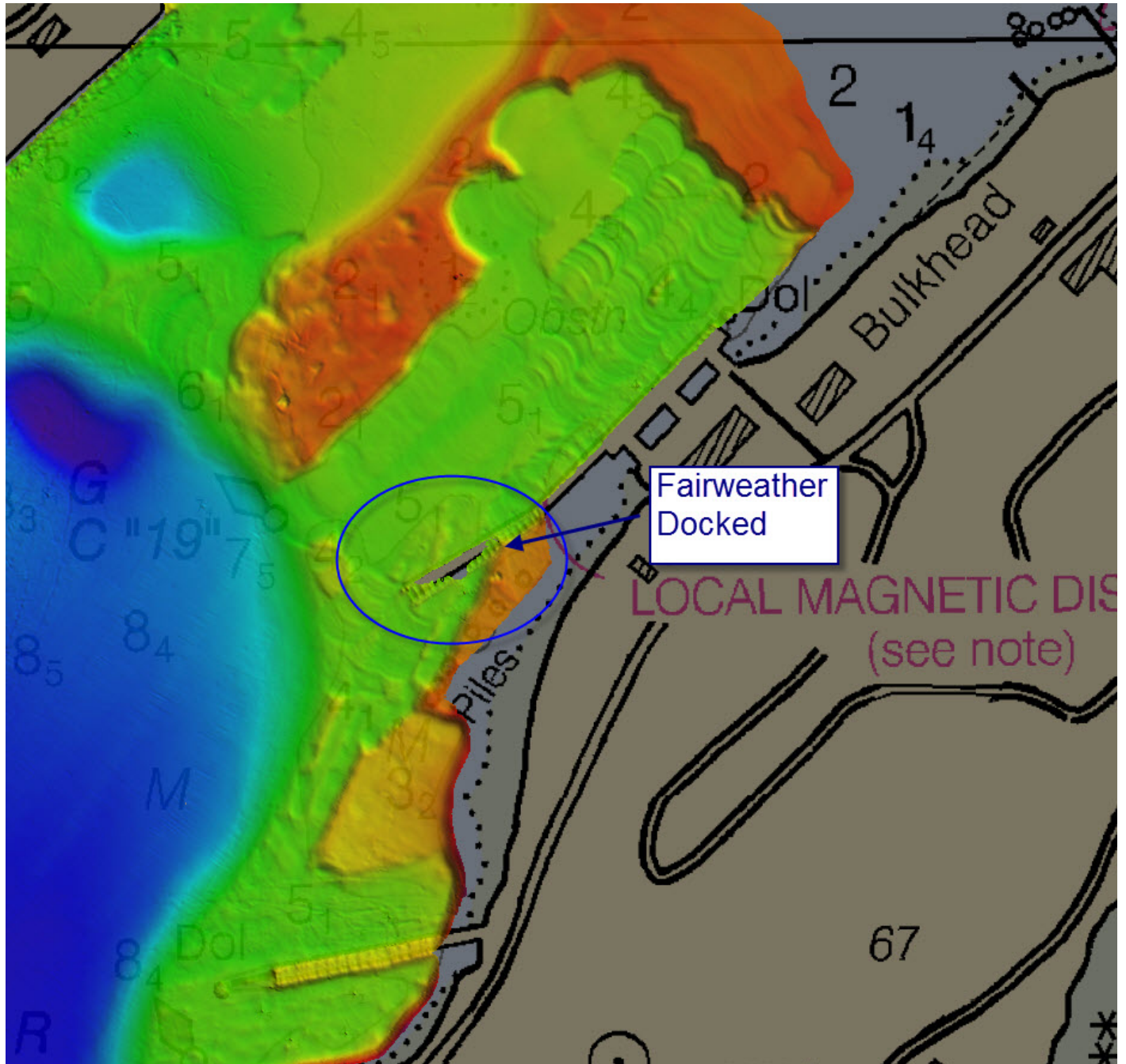


Figure 10: *Fairweather* Docked on the Pier

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

Raw Backscatter was logged as a 7k file and has been sent to the Processing Branch. One line of Backscatter was processed by the field unit for each vessel and frequency used per day of acquisition.

B.5 Data Processing

B.5.1 Software Updates

The following software updates occurred after the submission of the DAPR:

Manufacturer	Name	Version	Service Pack	Hotfix	Installation Date	Use
Caris	HIPS/SIPS	8.1.7			10/09/2014	Processing
Caris	HIPS/SIPS	8.1.8			06/30/2014	Processing
Caris	HIPS/SIPS	8.1.10			10/24/2014	Processing

Table 8: Software Updates

The following Feature Object Catalog was used: NOAA Extended Attribute Files V5.3.2

Due to an error in CARIS HIPS version 8.1.8 that causes TPU to be computed incorrectly, HIPS was reverted to 8.1.7 for Survey F00648. TPU and all surfaces were re-computed and the IHO uncertainty statistics was re-evaluated.

HIPS/SIPS 8.1.10 was not used to process this survey.

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
F00648_MB_1m_MLLW	CUBE	1 meters	-	NOAA_1m	Complete MBES
F00648_MB_2m_MLLW	CUBE	2 meters	-	NOAA_2m	Complete MBES
F00648_MB_1m_MLLW_Final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	Complete MBES
F00648_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
F00648_MB_2m_MLLW_Combined	CUBE	2 meters	-	NOAA_2m	Complete MBES

Table 9: Submitted Surfaces

The NOAA CUBE parameters mandated in HSSD were used for the creation of all CUBE BASE surfaces in Survey F00648. The surfaces have been reviewed where noisy data, or ‘fliers’ are incorporated into the gridded solution causing the surface to be shoaler or deeper than the true seafloor. Where these spurious soundings cause the gridded surface to be shoaler or deeper than the reliably measured seabed by greater than the maximum allowable Total Vertical Uncertainty at that depth, the noisy data have been rejected and the surface recomputed.

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 F00648 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Critical Soundings

Designation of soundings followed procedures as outlined in section 5.2.1.2 of the HSSD.

Survey F00648 contained 48 soundings which were Designated in CARIS HIPS. These designated soundings were used to draw the CUBE surface to the sounding which most accurately represented the sea floor in cases where the surface deviated from the sounding more than the vertical IHO requirements

allowed.

Additional designated soundings were required on the tops of submerged obstructions that did not have the least depths adequately represented and were not addressed in the final feature file.

C. Vertical and Horizontal Control

No additional Horizontal or Vertical Control Report will be submitted with F00648.

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
Kodiak Island, AK	9457292

Table 10: NWLON Tide Stations

File Name	Status
9457292.tid	Final Approved

Table 11: Water Level Files (.tid)

File Name	Status
F00648CORF.zdf	Final

Table 12: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 08/22/2014. The final tide note was received on 09/23/2014.

Final zoning and water level files were received for survey F00648.

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 5 North.

The following PPK methods were used for horizontal control:

Smart Base

Vessel kinematic data were post-processed using Applanix POSPac processing software, Smart Base methods described in the DAPR. Smooth Best Estimate of Trajectory (SBET) and associated error (RMS) data were applied to all MBES data in CARIS HIPS.

For further details regarding the processing and quality control checks performed see the F00648 POSPAC Processing Logs spreadsheet located in the SBET folder with the GNSS data.

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
AC39	SHUYAKISSPAK2006
AC26	CAPE_GULL_AK2008
AC67	PILLARMTN_AK2006
KOD6	KODIAK 6
AC38	QUARTZ_CRKAK2005

Table 13: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Kodiak 313 kHz (100 BPS)

Table 14: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

A comparison was performed between survey F00648 and Chart 16595 using CARIS sounding and contour layers derived from the 2-meter combined surface. The contours and soundings have been overlaid on the chart to assess differences. All data from F00648 should supersede charted data.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNLM Date	NM Date
16595	1:20000	16	10/2012	08/26/2014	09/13/2014

Table 15: Largest Scale Raster Charts

16595

Soundings from survey F00648 generally agreed within one to two meters with charted depths on chart 16595. Contours generated in CARIS HIPS and SIPS closely approximated the charted 3, 5, and 10 fathom contours. Notable exceptions to this general agreement are shown in the figures below. The 10 meter, 5 meter, and the Submerged piles contours are affected. The Submerged piles south of the Submerged piles Spoil Area on the Northwest corner of the chart show disagreements between the charted features and the MBES data. The charted soundings are accurate, but there are up to five submerged pilings in that area, but none of them are within the circled areas, Hydrographer recommends extending the Submerged piles Spoil Area to the Southwest to encompass these additional submerged piles.



Figure 11: Disagreement between chart Submerged Pilings and surveyed soundings

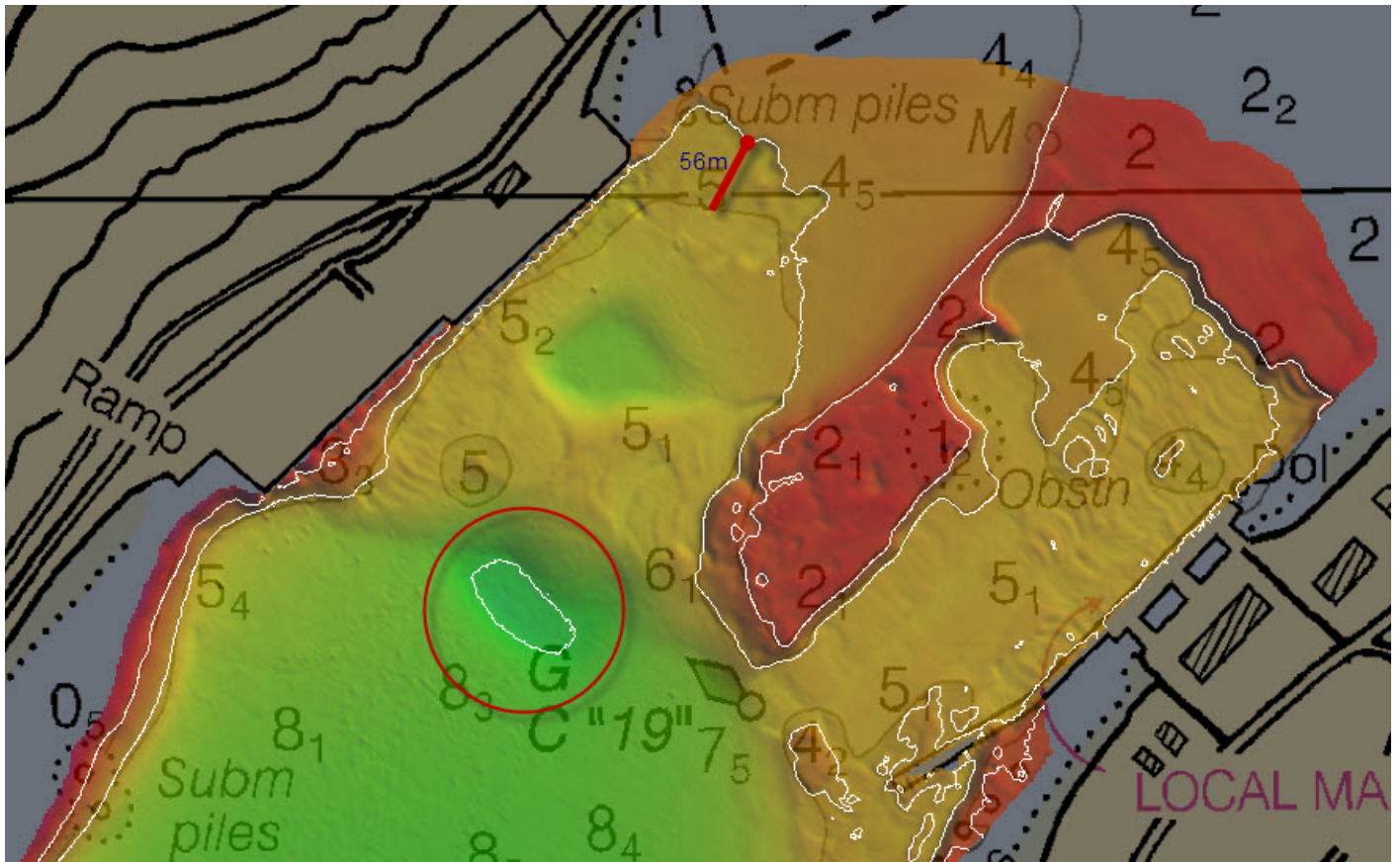


Figure 12: Contour Disagreements Northwest

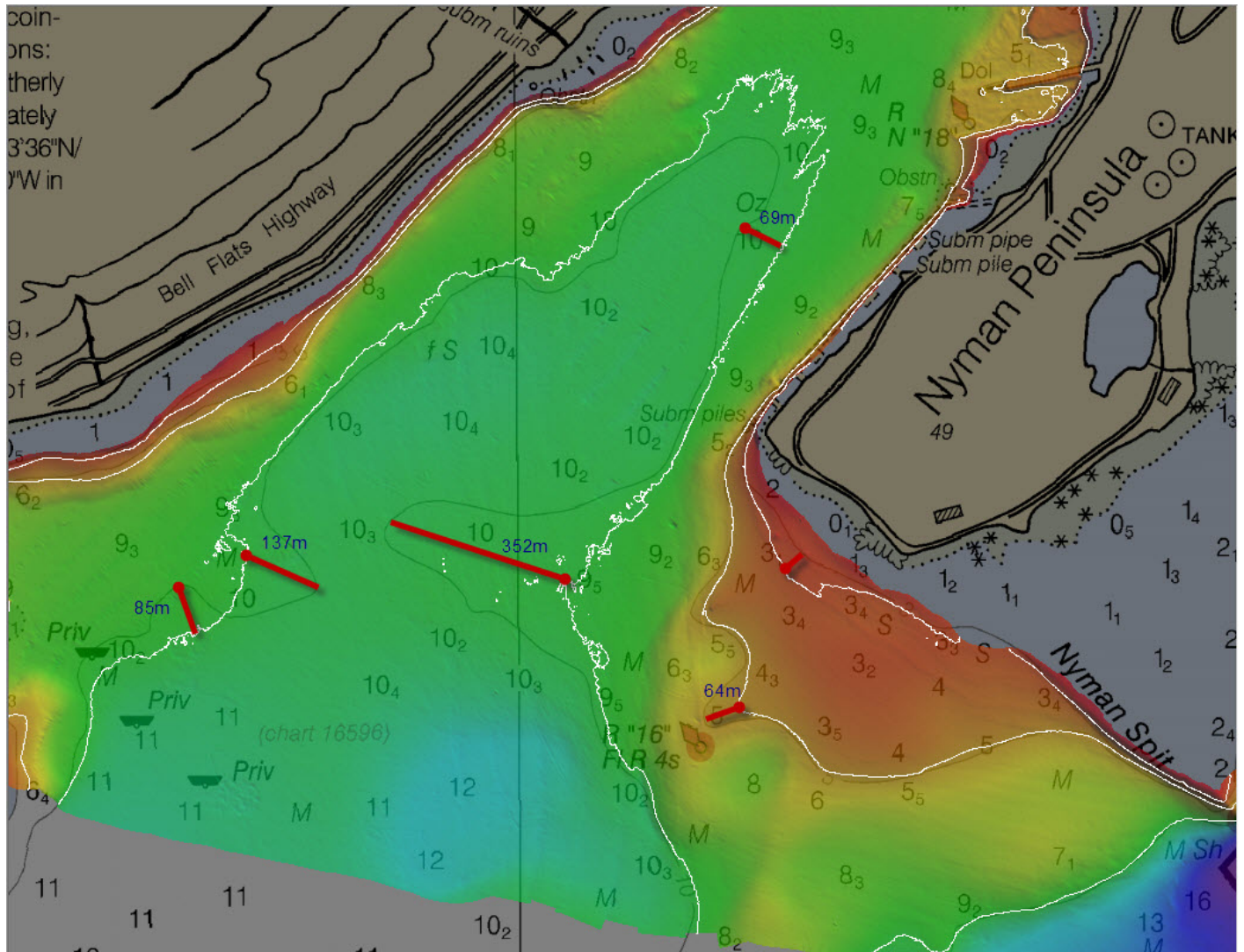


Figure 13: Contour Disagreements Southwest

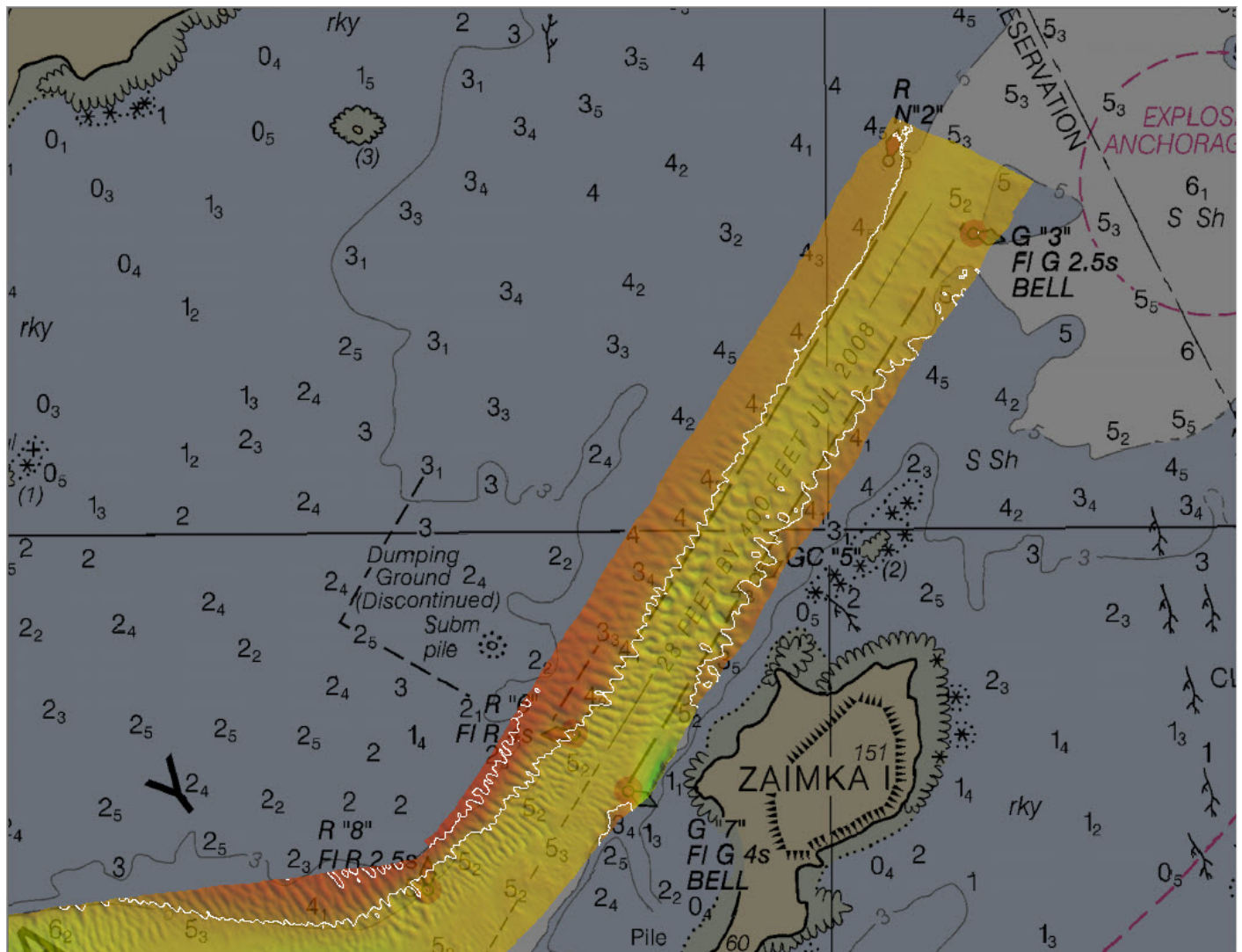


Figure 14: Contour Channel Agreements

Chart 16595 is not the largest scale chart for the survey area and the chart comparison should not have been done in meters. The survey should have been compared to Chart 16596, Scale 1:10,000, Edition 13, Edition Date 10/01/2012, LNM Date 10/20/2015, NM Date 10/17/2015. Upon review, surveyed depths generally agree within 2 feet of charted depths and the surveyed contours show good agreement with charted contours. The charted wreck and obstructions within the survey area were found to be accurately charted. There were also numerous uncharted obstructions that were identified and addressed during office review. As noted in the field chart comparison, the submerged piles near the spoil area in the northwest corner of the survey are mis-charted and have also been addressed during office review. SAR: It should be noted that the Spoil Area is not intended to define an area of submerged piles. There happens to be submerged piles within the Spoil Area, but they are two separate features. Therefore, it is not necessary to modify the extents of the Spoil Area to encompass the nearby submerged piles. It should also be noted that submerged piles aren't defined by contours as indicated in the chart comparison.

D.1.2 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5AK5DM	1:10000	7	08/28/2013	09/08/2014	NO

Table 16: Largest Scale ENC's

US5AK5DM

Soundings from survey F00648 generally agreed within zero to one fathoms on chart US4AK5DM. Contours in CARIS HIPS and SIPS closely approximate the charted contours. See discussion from Raster chart 16595 for more details.

This ENC does not correspond to Chart 16595 and the units for this ENC are not based in fathoms. The rednote comparison to Chart 16596 also applies to this ENC.

D.1.3 AWOIS Items

No AWOIS items were assigned for this survey.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

All charted features were investigated and are included in the F00648_Final_Feature_File.

No charted features were investigated during this survey. No charted features were included in the final feature file. The charted features were addressed during office review.

D.1.6 Uncharted Features

During acquisition a new obstruction was identified and investigated south of the USCG pier. The new feature was investigated with complete MBES coverage and by divers, the item was addressed and is included in the F00648 Final Feature File.

This feature was brought to the attention of the USCG port office and does not represent a danger to navigation.

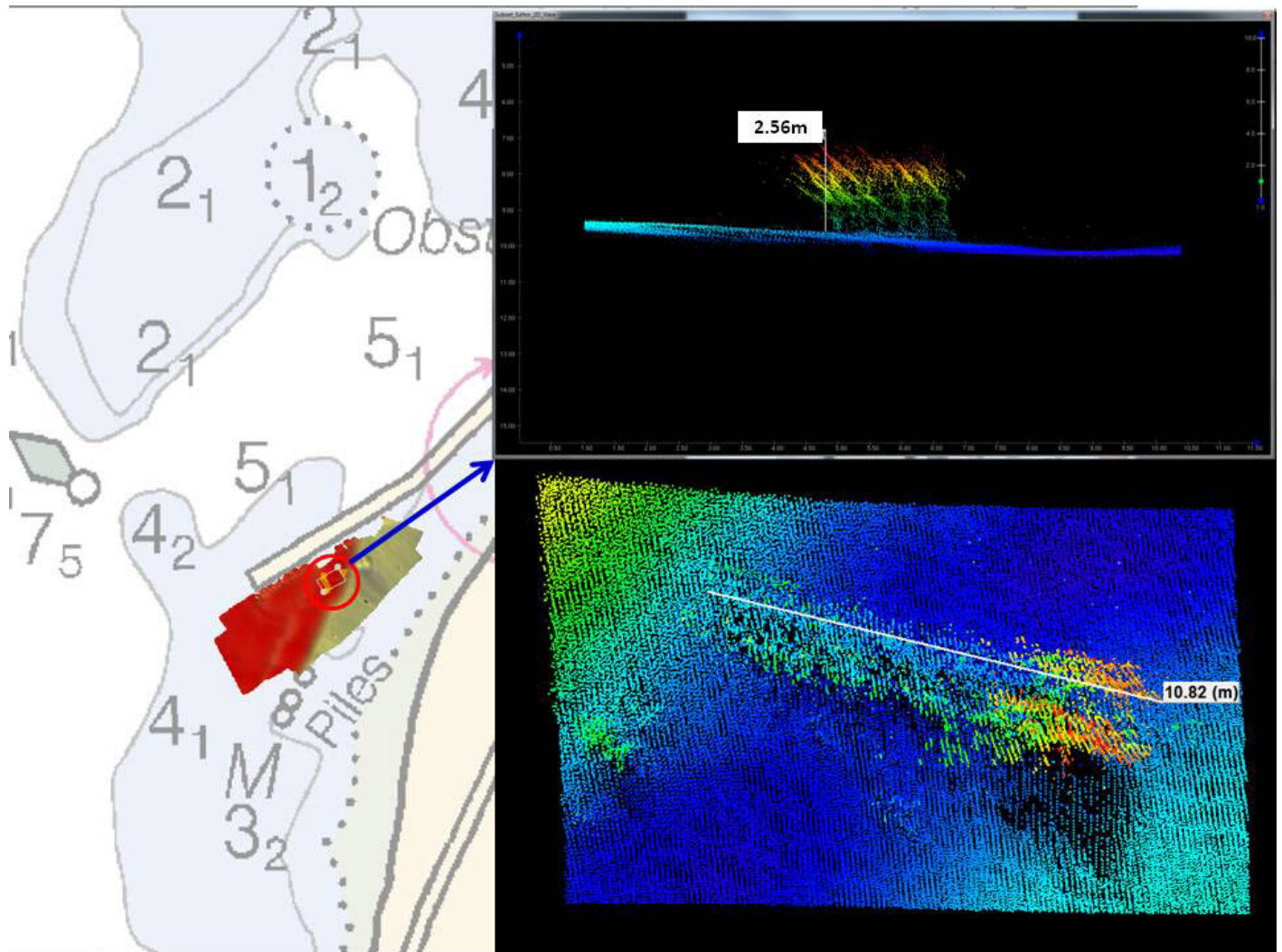


Figure 15: Gangway next to pier

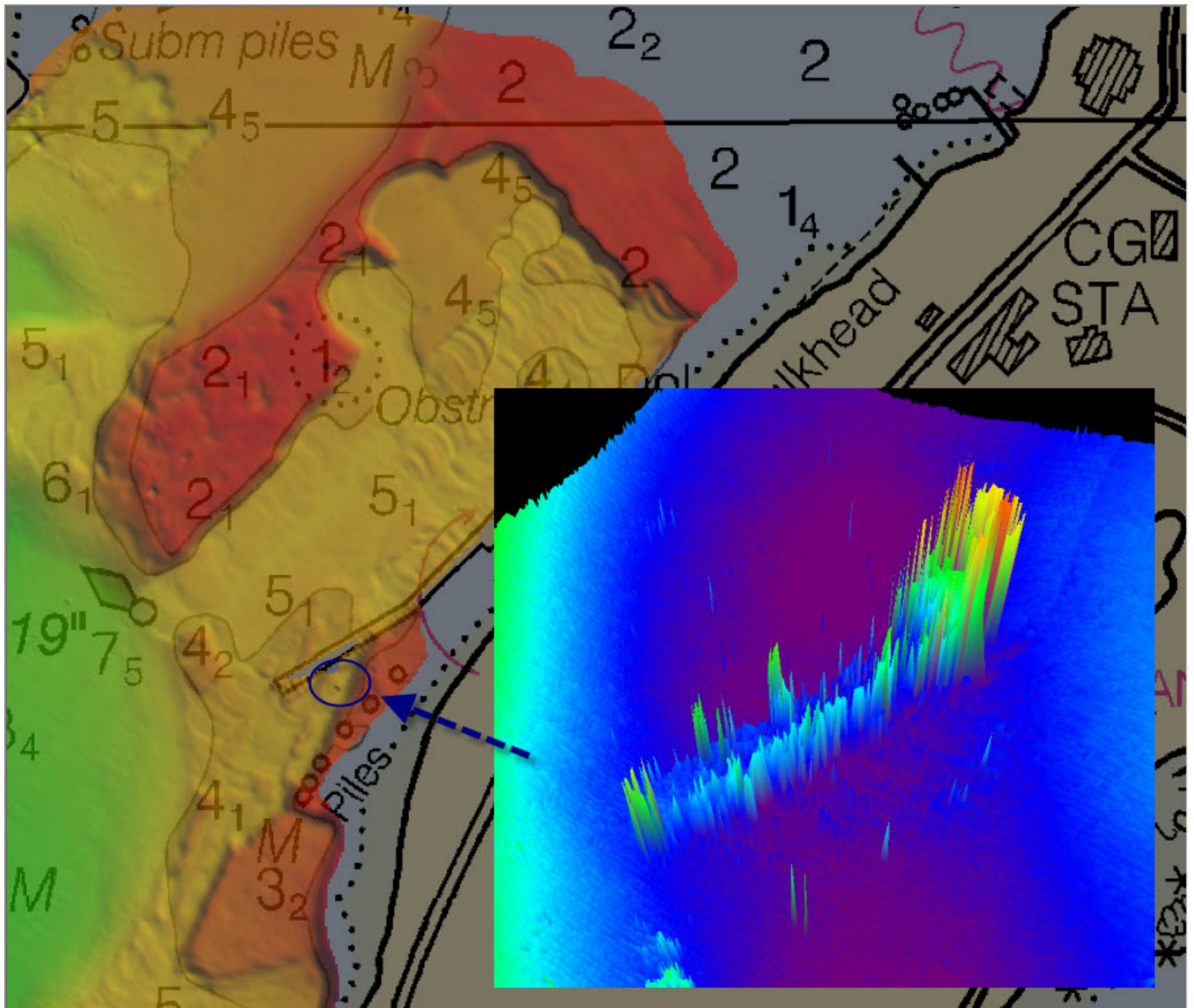


Figure 16: Gangway in 3d surface display



Figure 17: Gangway rail from Dive Ops

There were numerous uncharted features identified and addressed during office review that were not identified by the field unit.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No uncharted shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

Soundings from survey F00648 generally agreed within one fathom with charted depths in the Womens Bay entrance channel within the survey limits.

Other than a correctly charted 27 ft sounding encroaching within the extents of the channel near marker buoy G "5", there are no surveyed depths shoaler than the 28 ft controlling depth listed for the Womens Bay Entrance Channel.

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

Prior survey comparisons exist for this survey, but were not investigated.

D.2.3 Aids to Navigation

Aids to navigation (ATONs) exist within the limits of this survey and were observed to be on-station and are serving their intended purpose.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

All charted submarine features were investigated with MBES and found to be charted properly. No new submarine features were discovered.

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.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits, however past dredging has left some scars in the sediment.

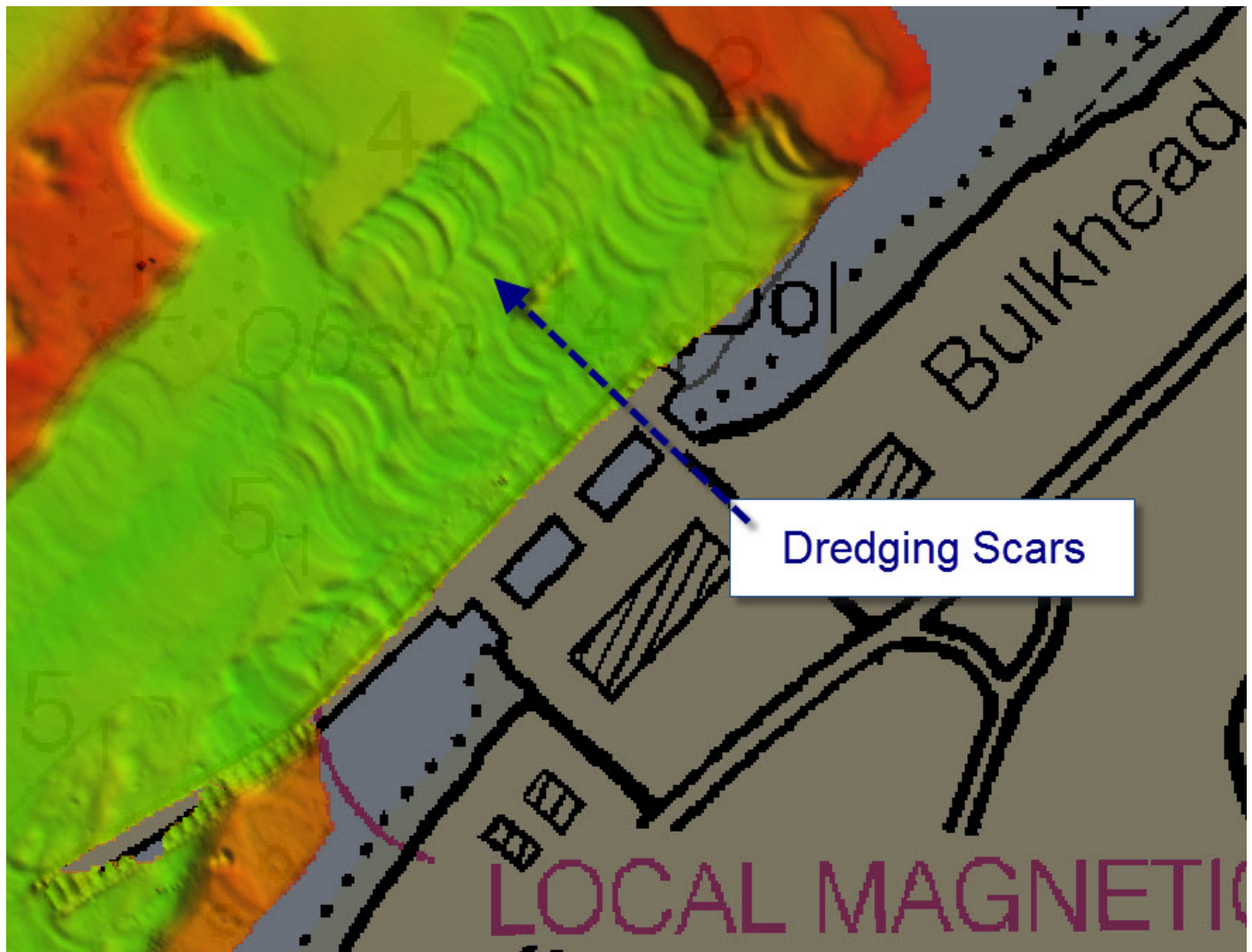


Figure 18: Dredging Scars

D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

D.2.11 Inset Recommendation

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 data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, 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
DAPR	2014-10-03
Coast Pilot Review	2014-12-09

Approver Name	Approver Title	Approval Date	Signature
CDR David J. Zezula	Chief of Party	06/17/2015	 David Zezula 2015.06.21 18:23:29 -08'00'
LT Ryan A. Wartick	Field Operations Officer	06/17/2015	 Digitally signed by Ryan Wartick DN: cn=Ryan Wartick, o=Fairweather, ou=OMAO, email=ryan.wartick@noaa.gov, c=US Date: 2015.06.18 09:18:48 -08'00'
LT Matthew M. Forney	Field Operations Officer	06/17/2015	 Matthew Forney 2015.06.18 07:56:45 -08'00'
HCST Douglas Bravo	Chief Survey Technician	06/17/2015	 2015.06.17 19:05:59 -08'00'
HSST Joy Nalley	Sheet Manager	06/17/2015	 Joy Nalley Digitally signed by Joy Nalley DN: cn=Joy Nalley, o=OMAO, ou=NOAA Ship Fairweather, email=joy.nalley@noaa.gov, c=US Date: 2015.06.22 08:02:47 -08'00'

F. Table of Acronyms

Acronym	Definition
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 Station
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
FFF	Final Feature File
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
HSSD	Hydrographic Survey Specifications and Deliverables

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
TPE	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning System timing message
ZDF	Zone Definition File



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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 15, 2014

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P335-FA-2014
HYDROGRAPHIC SHEET: F00648

LOCALITY: Womens Bay, South Kodiak, AK
TIME PERIOD: August 11 - August 18, 2014

TIDE STATION USED: 945-7292 Kodiak Island, AK
Lat. 57° 43.8'N Long. 152° 30.8' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.400 meters

ESTIMATED ZONING ERROR: 0.11 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SWA110.

Refer to attachments for zoning information.

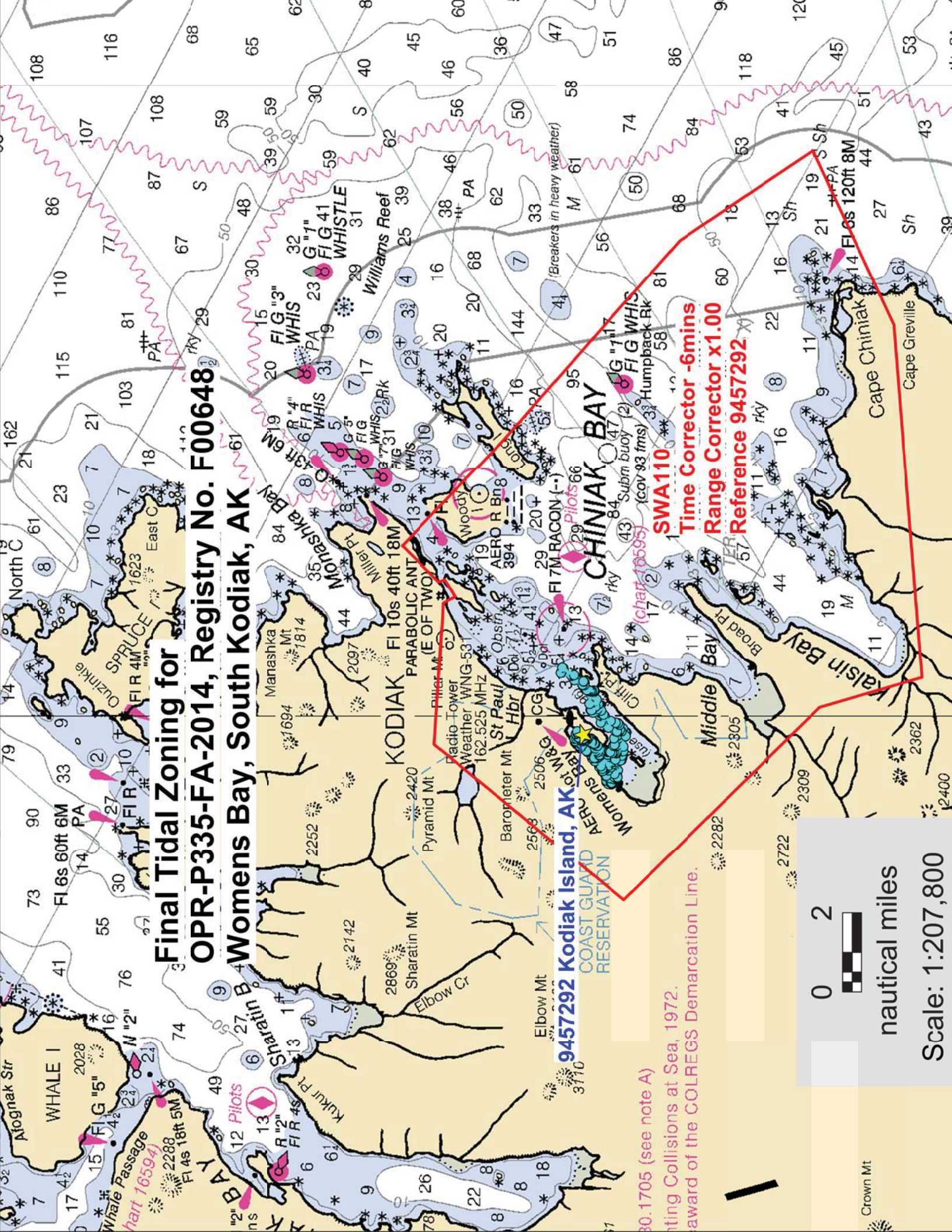
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: For Kodiak Island, AK(945-7292), annual leveling was not done in 2013, and the leveling data for 2014 is not ready so far. A review of the verified leveling records from August 2002 - June 2012 shows the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for survey OPR-P335-FA-2014, F00648. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

HOVIS.GERALD.THOMAS.JR.1365860250
Digitally signed by
HOVIS.GERALD.THOMAS.JR.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=OTHER, cn=HOVIS.GERALD.THOMAS.JR.1365860250
Date: 2014.09.23 10:12:30 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH





**Final Tidal Zoning for
OPR-P335-FA-2014, Registry No. F00648**

Womens Bay, South Kodiak, AK

9457292 Kodiak Island, AK
COAST GUARD
RESERVATION

80.1705 (see note A)
Warning Collisions at Sea, 1972.
award of the COLREGS Demarcation Line.

SWA110
Time Corrector -6mins
Range Corrector x1.00
Reference 9457292



nautical miles
Scale: 1:207,800

Crown Mt

APPROVAL PAGE

F00648

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

- F00648_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00648_GeoImage.pdf

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

Approved: _____

Annie Raymond

Cartographic Team Lead, Pacific Hydrographic Branch

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

Approved: _____

Pete Holmberg, NOAA

Acting Chief, Pacific Hydrographic Branch