D00245

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	D00245

LOCALITY

State(s):	Alaska
General Locality:	Southeast Alaska
Sub-locality:	Noyes Canyon

2018

CHIEF OF PARTY
CDR Mark Van Waes

LIBRARY & ARCHIVES

Date:

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET		**D00245**

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:	**Southeast Alaska**
Sub-Locality:	**Noyes Canyon**
Scale:	**1: 100,000**
Dates of Survey:	**04/25/2018 to 06/29/2018**
Instructions Dated:	**03/14/2018**
Project Number:	**OPR-O190-FA-18**
Field Unit:	**NOAA Ship *Fairweather***
Chief of Party:	**CDR Mark Van Waes**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder**
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 Envitronmental Information (NCEI) and can be retrieved via http://www.ncei.noaa.gov/.

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey D00245

Project: D00245

Locality: Southeast Alaska

Sublocality: Noyes Canyon

Scale: 1:100000

April 2018 - June 2018

NOAA Ship *Fairweather*

Chief of Party: CDR Mark Van Waes

A. Area Surveyed

The survey area is located in Southeast Alaska within the sub locality of Noyes Canyon.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
55° 18' 21.18" N 134° 47' 54.9" W	54° 22' 1.21" N 133° 53' 25.78" W

Table 1: Survey Limits

In an effort to ensure that the highest quality product providing optimal customer satisfaction is delivered to the United States Geologic Survey (USGS), Fairweather consulted with the USGS science party funding the majority of this project to determine what would constitute a successful mission. The science party provided a polygon highlighting the area they determined to be the highest priority, focusing primarily on the vicinity of the Queen Charlotte Fault. This polygon extended westward of the sheet limits provided by HSD-OPS to include the entirety of the fault line and surrounding bathymetry (Figure 1). A waiver was submitted to and approved by the Project Manager to adjust the sheet limits to include the area deemed highest priority by the USGS scientists. This waiver is included in Appendix II.

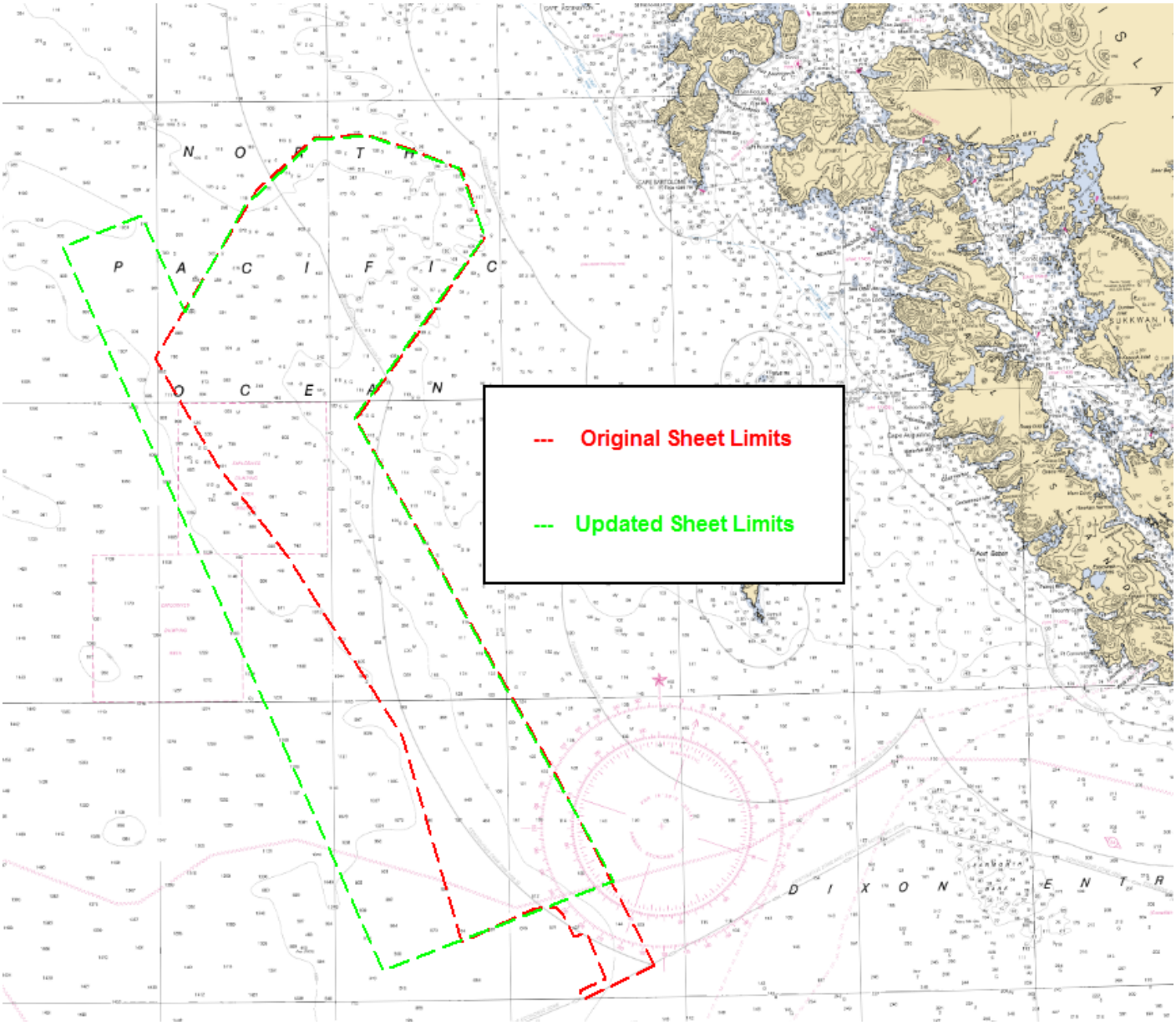


Figure 1: D00245 sheet limits

A.2 Survey Purpose

D00245 was partially funded by USGS (five days) and spanned nine calendar days of acquisition. The Queen Charlotte Fault system is a major right-lateral transform boundary with limited offshore data coverage. Five documented earthquakes of magnitude seven or greater occurred in this region since 1900, including events in 2012 (magnitude of 7.9) and 2013 (magnitude of 7.5), leading to concern of tsunami and landslide risk in the area. Data collected within D00245 covers the last remaining unmapped portion of the Queen Charlotte Fault, providing valuable data to enhance the study of these marine geohazards.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired in D00245 meet multibeam echo sounder (MBES) coverage requirements for complete coverage, as required by the HSSD. This includes crosslines (see Section B.2.1), NOAA allowable uncertainty (see Section B.2.10), and density requirements (see Section B.2.11). Additional compliance statistics can be found in the Standards and Compliance Review located in Appendix II of this report.

A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
All waters within the survey area	Complete coverage MBES with concurrent MBES backscatter and water column data

Table 2: Survey Coverage

Due to time constraints while on project, survey efforts were focused on the areas of highest interest to the USGS scientists. Following correspondence with the USGS scientists, efforts were focused in the vicinity of the Queen Charlotte Fault and Noyes Canyon, with less emphasis on the areas inshore of the shelf edge. A record of this correspondence has been included in Appendix II. See Figure 2 for an overview of coverage.

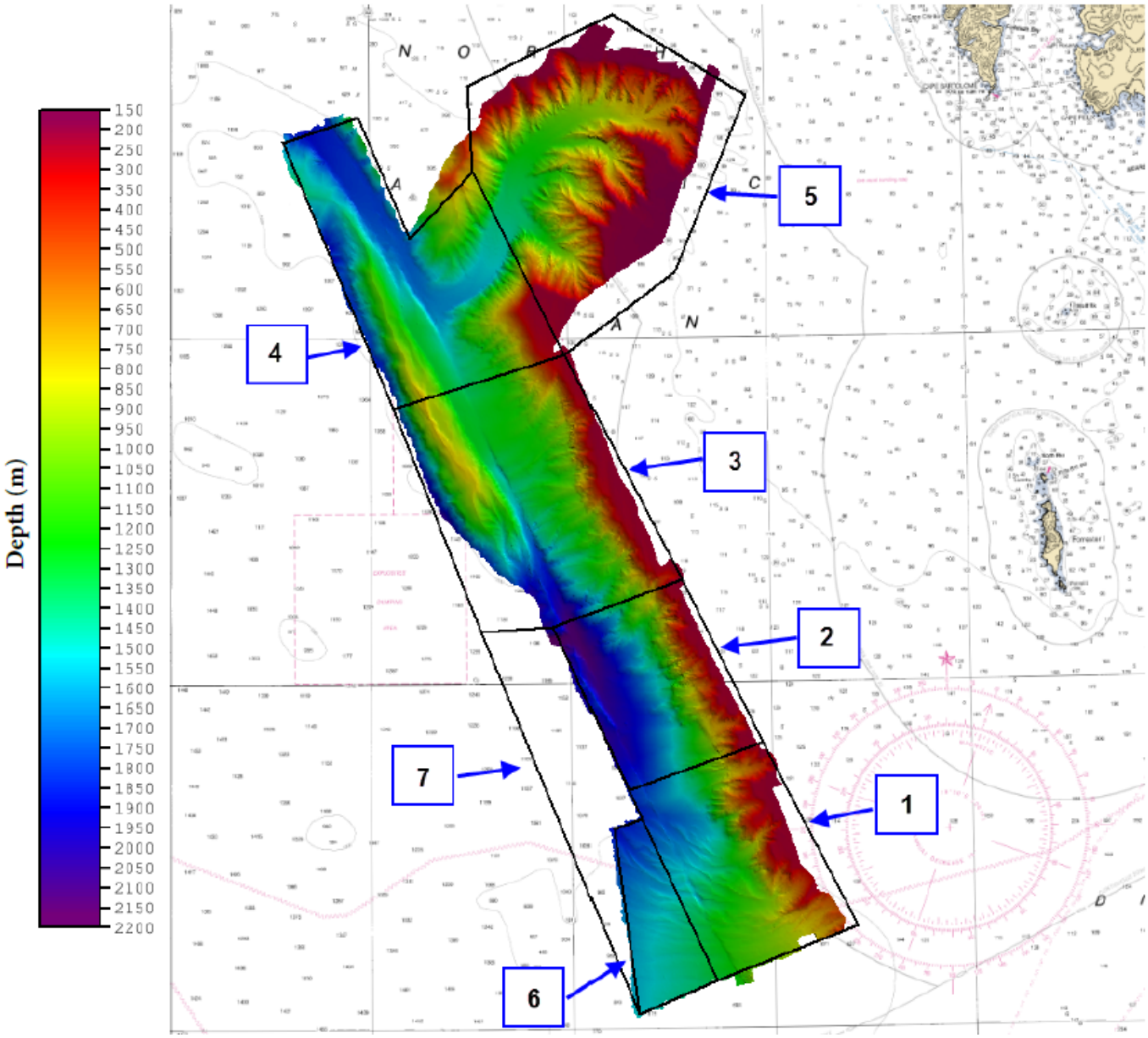


Figure 2: D00245 survey coverage with USGS priority polygons

A.6 Survey Statistics

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

	HULL ID	*S220*	*Total*
LNM	**SBES Mainscheme**	0	0
	MBES Mainscheme	1067.42	1067.42
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	41.46	41.46
	Lidar Crosslines	0	0
Number of Bottom Samples			0
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			655

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
04/25/2018	115
04/26/2018	116

Survey Dates	Day of the Year
04/27/2018	117
05/01/2018	121
05/02/2018	122
05/03/2018	123
05/04/2018	124
05/05/2018	125
05/06/2018	126
06/27/2018	178
06/28/2018	179
06/29/2018	180

Table 4: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the OPR-O190-FA-18 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	***S220***
LOA	70.4 meters
Draft	4.8 meters

Table 5: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg Maritime	EM 710	MBES
AML Oceanographic	MVP200	Conductivity, Temperature, and Depth Sensor
Teledyne RESON	SVP 70	Sound Speed System
Applanix	POS MV 320 v5	Positioning and Attitude System
Sea-Bird Scientific	SBE 19	Sound Speed System

Table 6: Major Systems Used

The equipment was installed on the survey platforms as follows: S220 utilizes the Kongsberg EM 710 MBES, SVP 70 surface sound speed sensors, and AML Oceanographic MVP 200 for conductivity, temperature, and depth (CTD) casts. On day numbers 115 and 116 the MVP 200 was inoperable, and the Sea-Bird Scientific SBE 19 was used to take static CTD casts.

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 3.88% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with Section 5.2.4.3 of the HSSD. To evaluate crosslines, a surface generated via data strictly from mainscheme lines and a surface generated via data strictly from crosslines were created. From these two surfaces, a difference surface (mainscheme - crosslines = difference surface) was generated (Figure 3), and is submitted in the Separates II Digital Data folder. Statistics show the mean difference between the depths derived from mainscheme data and crossline data was 0.14 meters (with mainscheme being deeper) and 95% of nodes falling within 6.30 meters (Figure 4). For the respective depths, the difference surface was compared to the allowable NOAA uncertainty standards. In total, more than 99.5% of the depth differences between D00245 mainscheme and crossline data were within allowable NOAA uncertainties.

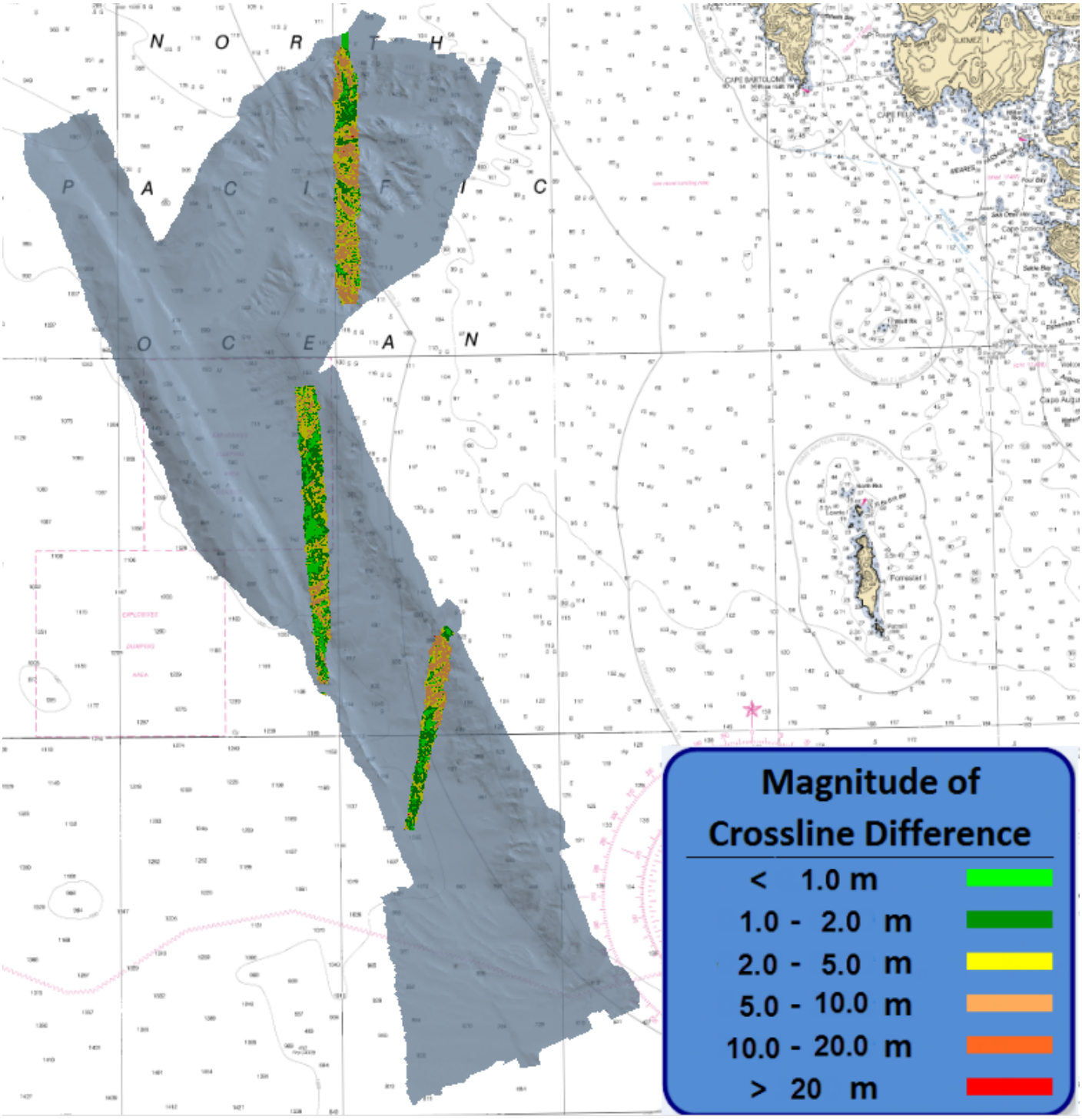
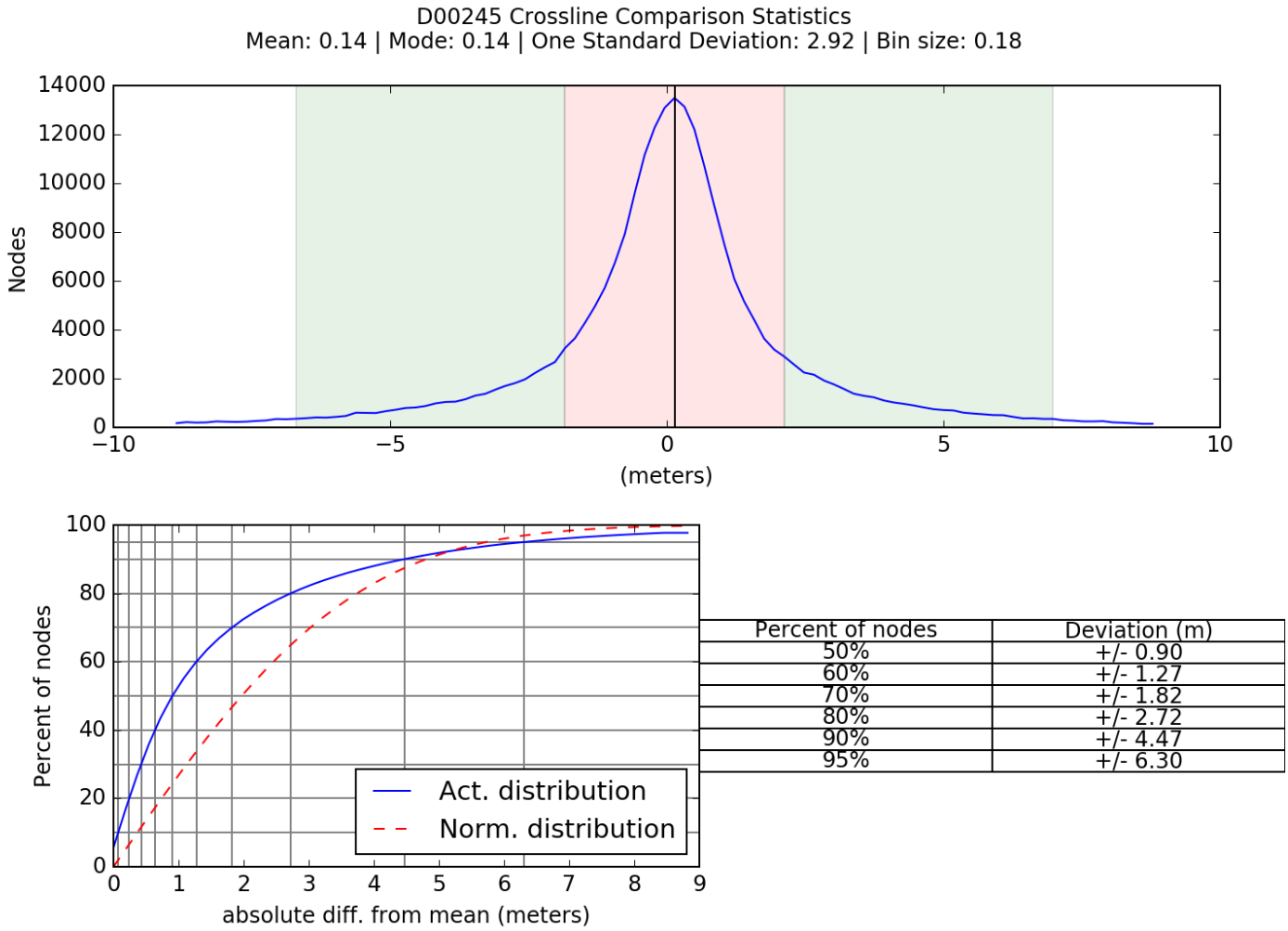


Figure 3: D00245 crossline comparison



Percent of nodes	Deviation (m)
50%	+/- 0.90
60%	+/- 1.27
70%	+/- 1.82
80%	+/- 2.72
90%	+/- 4.47
95%	+/- 6.30

Figure 4: D00245 crossline comparison statistics

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via PMVD	0 meters	0.15 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S220	2.0 meters/second	1.0 meters/second	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

In addition to the usual a priori estimates of uncertainty provided via device models for vessel motion and ERZT, real-time and post-processed uncertainty sources were also incorporated into the depth estimates within survey D00245. Real-time uncertainties were provided via EM 710 data, Applanix Delayed Heave RMS, and TCARI tides. Following post-processing of the real-time vessel motion, recomputed uncertainties of vessel roll, pitch, gyro and navigation were applied in CARIS HIPS and SIPS via a Smoothed Best Estimate of Trajectory (SBET) RMS file generated in Applanix POSPac.

B.2.3 Junctions

D00245 junctions with one survey from a prior project, D00208, as shown in Figure 5. The area of overlap between surveys was reviewed within CARIS HIPS and SIPS via surface differencing to assess surface agreement. For this junction a negative difference indicates D00245 was shoaler and a positive difference indicates D00245 was deeper.

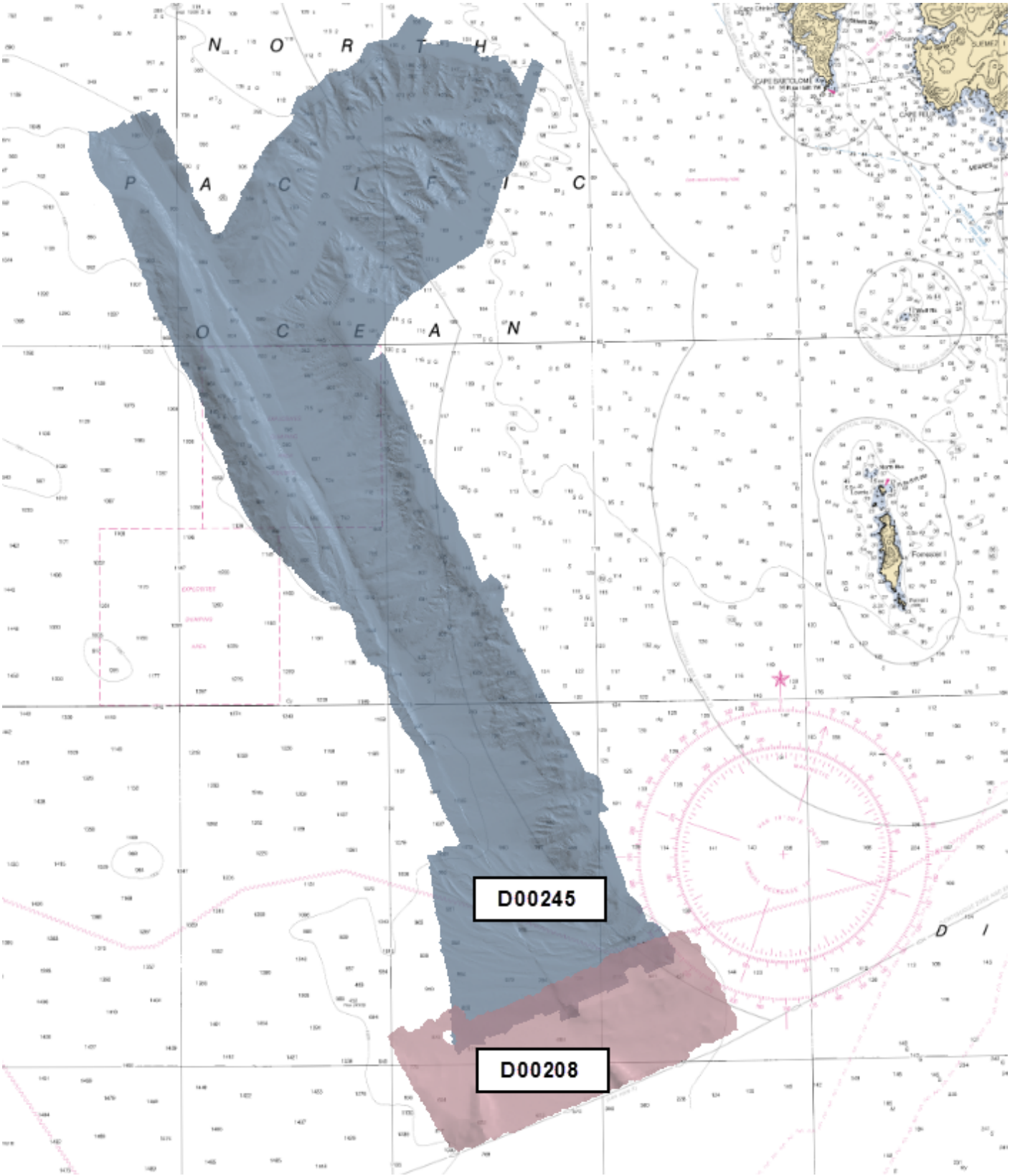


Figure 5: D00245 junction overview

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
D00208	1:100000	2017	NOAA Ship FAIRWEATHER	S

Table 9: Junctioning Surveys

D00208

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the surface from D00245 and the surface from D00208 (Figure 6). The statistical analysis of the difference surface shows a mean of -1.25 meters with 95% of all nodes having a maximum deviation of +/- 3.81 meters, as seen in Figure 7. It was found that more than 99.5% of nodes are within NOAA allowable uncertainty.

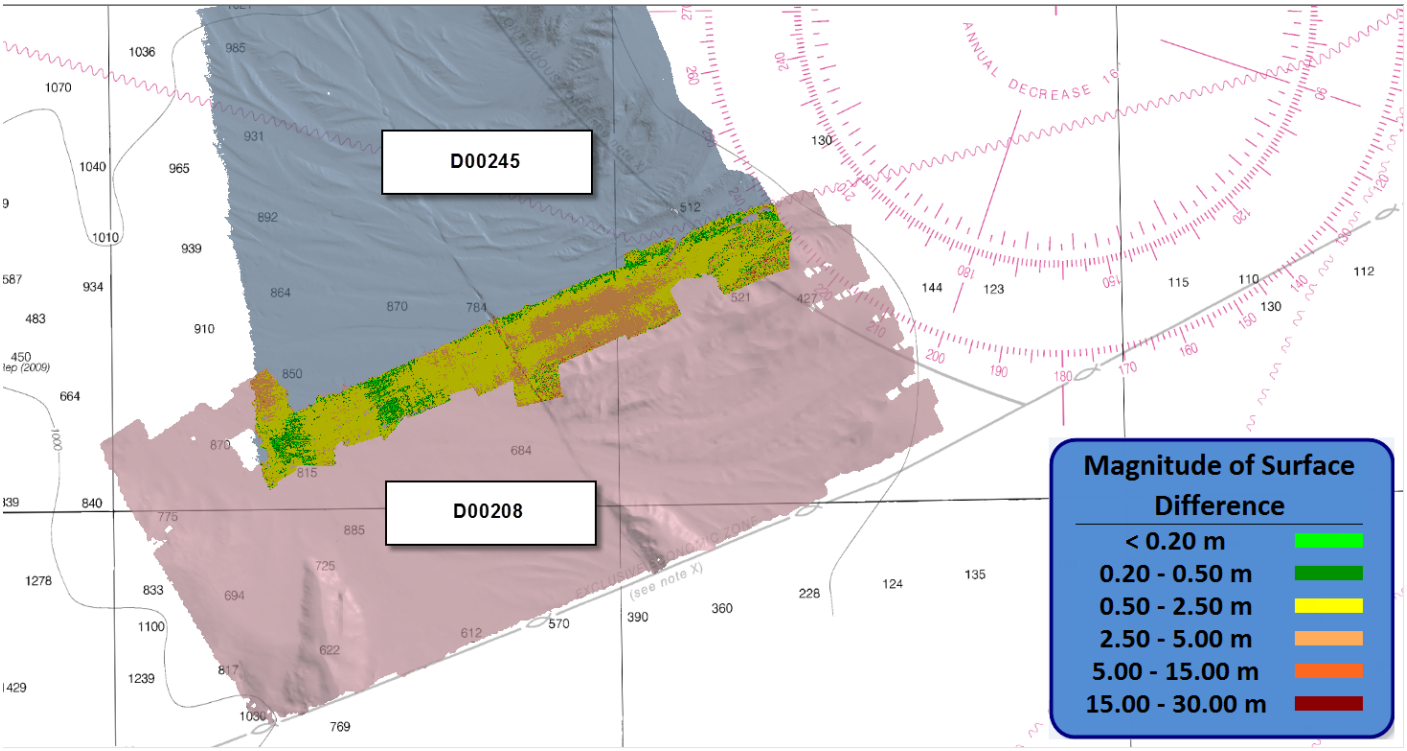
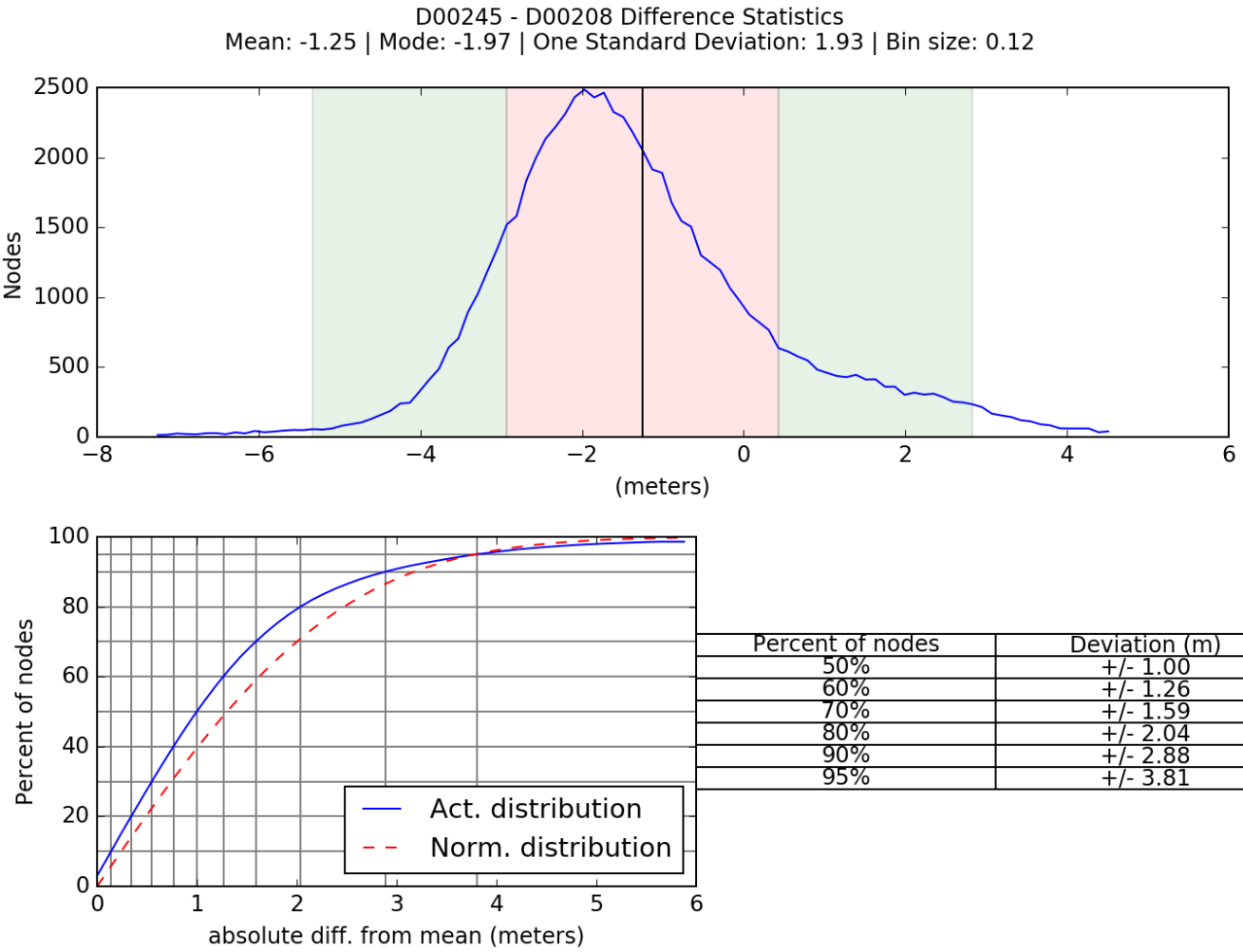


Figure 6: Difference surface between D00245 (grey) and junctioning survey D00208 (pink)



Percent of nodes	Deviation (m)
50%	+/- 1.00
60%	+/- 1.26
70%	+/- 1.59
80%	+/- 2.04
90%	+/- 2.88
95%	+/- 3.81

Figure 7: Difference surface statistics between D00245 and D00208

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

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Minimum of one cast every six hours.

On day numbers 115 and 116 the MVP was inoperable, and therefore static casts were taken with the SBE 19 CTD. These casts were taken at an interval of approximately one every six hours, ensuring that all data is within four hours of a cast. Functionality was restored on the MVP for the rest of the survey, and the cast frequency was increased to approximately once an hour, targeting areas of differing surface sound speed.

B.2.8 Coverage Equipment and Methods

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

B.2.9 Holidays

D00245 data were reviewed in CARIS HIPS and SIPS for holidays in accordance with Section 5.2.2.3 of the HSSD. No holidays which meet the definition described in the HSSD for complete coverage were identified via the Pydro QC Tools Holiday Finder tool. This tool automatically scans the surface for holidays as defined in the HSSD and was run in conjunction with a visual inspection of the surface by the hydrographer.

B.2.10 NOAA Allowable Uncertainty

The surface was analyzed using the Pydro QC Tools Grid QA feature to determine compliance with specifications. Overall, more than 99% of nodes within the surface meet NOAA allowable uncertainty specifications for D00245. See the Standards and Compliance Review located in Appendix II for a graphical representation of uncertainty compliance.

B.2.11 Density

The surface was analyzed using the Pydro QC Tools Grid QA feature to determine compliance with specifications. Overall, more than 99% of nodes within the surface meet density specifications for D00245. See the Standards and Compliance Review located in Appendix II for a graphical representation of density compliance.

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 data are stored in the .all file for the Kongsberg EM710. All backscatter data have been processed by the field unit via Fledermaus FMGT 7.8.1. All processed mosaics and .gsf files have been submitted to the Pacific Hydrographic Branch. See Figure 8 for a complete mosaic.

Due to the automatic generation of new .all files at thirty minute intervals to avoid the creation of unmanageably large file sizes and to alleviate the risk of file corruption, brief gaps exist in the submitted six meter mosaic (Figure 9). These gaps were not observed in the MBES data, likely due to the lower resolution surface generated for these depths. The interpretation of the mosaic is not likely hindered by the presence of said gaps.

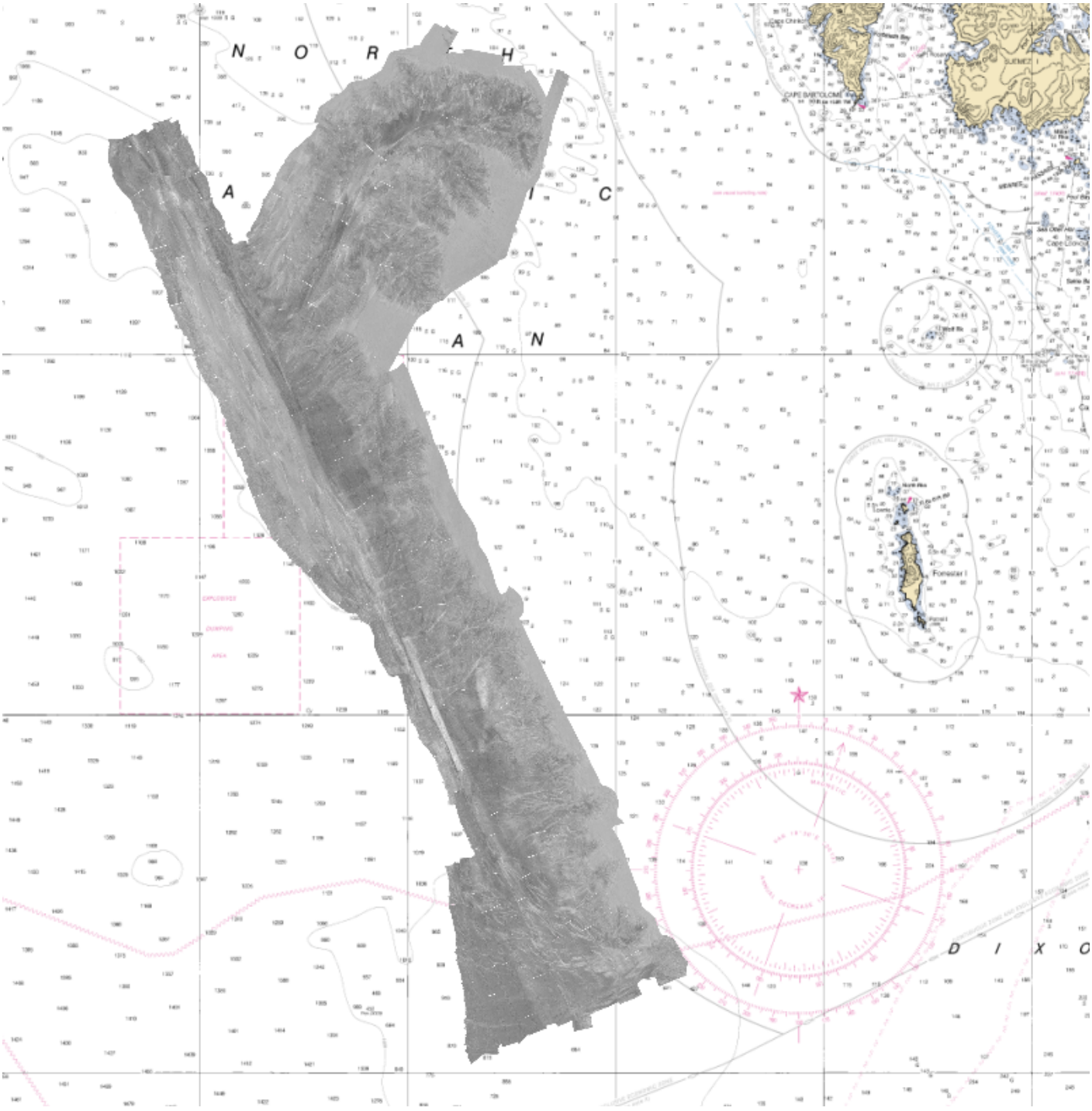


Figure 8: Overview of D00245 backscatter (6 meter mosaic)

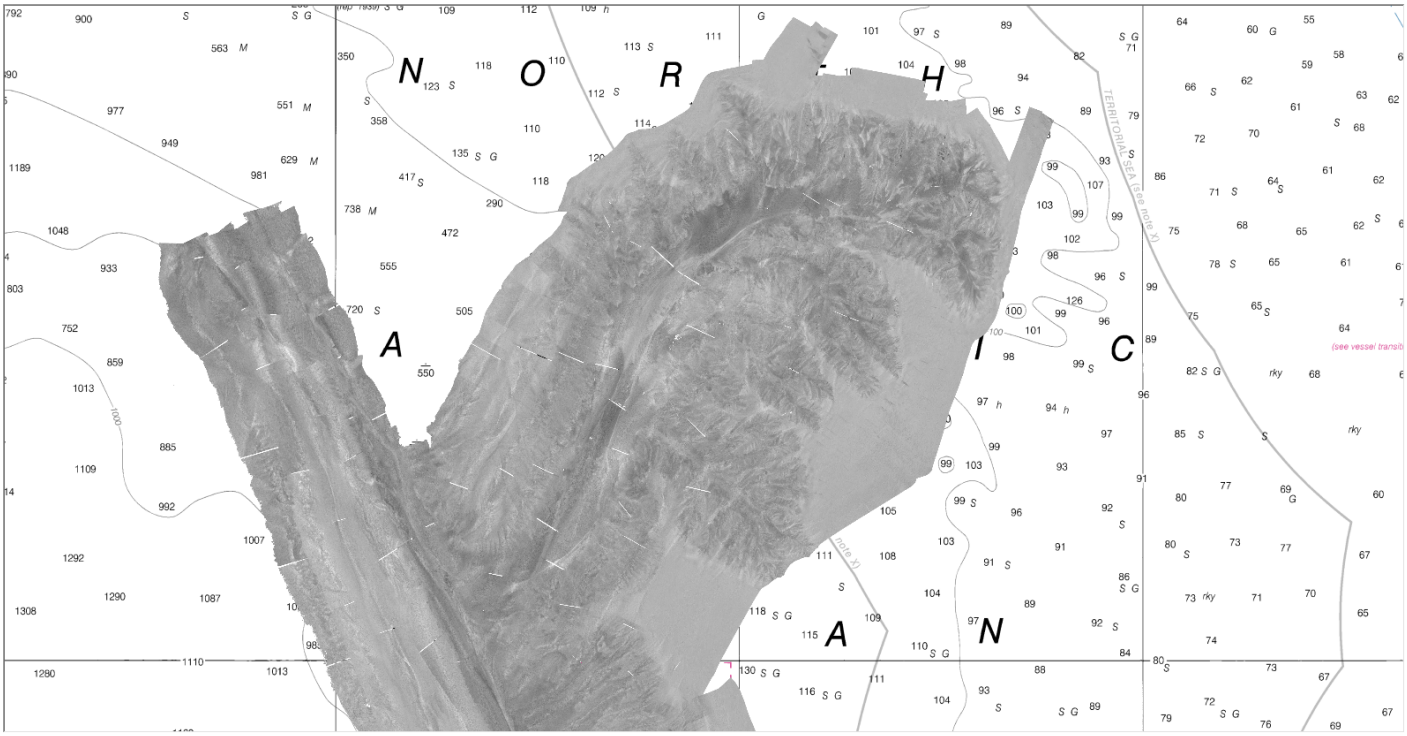


Figure 9: Data gaps observed in the backscatter mosaic

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
Teledyne CARIS	HIPS/SIPS	10.4.3

Table 10: Primary bathymetric data processing software

The following software program was the primary program used for imagery data processing:

Manufacturer	Name	Version
QPS	Fledermaus FMGT	7.8.1

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile V5_7.

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
D00245_MB_VR_MLLW	CARIS VR Surface (CUBE)	16-32 meters	170.4 meters - 2175.6 meters	NOAA_VR	Complete MBES
D00245_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	16-32 meters	170.4 meters - 2175.6 meters	NOAA_VR	Complete MBES

Table 12: Submitted Surfaces

The D00245 variable resolution surface was generated via the Ranges Estimation Method within CARIS HIPS and SIPS. See the DAPR for a detailed description of the parameters used during surface generation. The surface was then reviewed where noisy data, or "fliers", were incorporated into the gridded solution causing the surface to be shoaler or deeper than the true sea floor. Where these spurious soundings cause the gridded surface to vary from the reliably measured seabed by greater than the maximum allowable Total Vertical Uncertainty at that depth, the noisy data have been rejected by the hydrographer and the surface recomputed.

Flier Finder v6, part of the QC Tools package within Pydro, was used to assist the search for spurious soundings following gross cleaning. Flier Finder was run iteratively until all remaining flagged fliers were deemed to be valid aspects of the steep slopes and dynamic nature of the seafloor.

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 speed application are noted in the D00245 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

C. Vertical and Horizontal Control

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

C.1 Vertical Control

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

Traditional Methods Used:

TCARI

File Name	Status
9450460.tid	Final Approved

Table 13: Water Level Files (.tid)

File Name	Status
O190_O360_O375_O392_FA2018.tc	Final

Table 14: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 06/29/2018. The final tide note was received on 07/06/2018.

Initial reduction of acquired data to MLLW was accomplished via traditional tidal means using the TCARI grid provided by HSD-OPS. Following the successful application of SBETs and computation of an Ellipsoidally Referenced Zone Tide (ERZT) separation model, ERS methods were used for reducing data to MLLW.

ERS Methods Used:

ERS via ERZT

Ellipsoid to Chart Datum Separation File:

D00245_ERZT_1000m.csar

ERS methods were used as the final means of reducing D00245 to MLLW for submission. Data were initially reduced via traditional tidal means until an ERZT separation model could be calculated following the successful application of SBETs. The ERZT was checked for consistency to ensure that no anomalies were observed in the model, and then used to reduce all data to MLLW.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum 1983.

The projection used for this project is UTM Zone 8N.

Vessel kinematic data were post-processed using Applanix POSPac processing software and RTX methods described in the DAPR. Smoothed Best Estimate of Trajectory (SBET) and associated error (RMS) data were applied to all MBES data in CARIS HIPS and SIPS. For further details regarding the processing and quality control checks performed, see the D00245 POSPAC Processing Logs spreadsheet located in the Separates folder.

During real-time acquisition, S220 received correctors from the Wide Area Augmentation System (WAAS) for increased accuracies similar to USCG DGPS stations. WAAS and SBETs were the sole methods of positioning for D00245 as no DGPS stations were available for realtime horizontal control.

D. Results and Recommendations

D.1 Chart Comparison

A comparison was performed between survey D00245 and ENC US3AK40M using CARIS HIPS and SIPS sounding layers derived from the surface generated from D00245 data. The soundings were overlaid on the chart to assess differences between the surveyed soundings and charted depths. All D00245 data should supersede charted data. In general, surveyed soundings agree with the majority of charted depths. A full discussion of the comparison follows below.

D.1.1 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3AK40M	1:229376	13	06/28/2017	06/28/2017	NO
US1WC01M	1:3500000	43	02/27/2018	02/27/2018	NO

Table 15: Largest Scale ENCs

US3AK40M

Although the majority of charted soundings relatively agree with surveyed soundings, the sounding density of charted soundings is insufficient to characterize the bathymetric trends in some areas (Figure 10). The hydrographer recommends superseding all charted soundings with surveyed data.

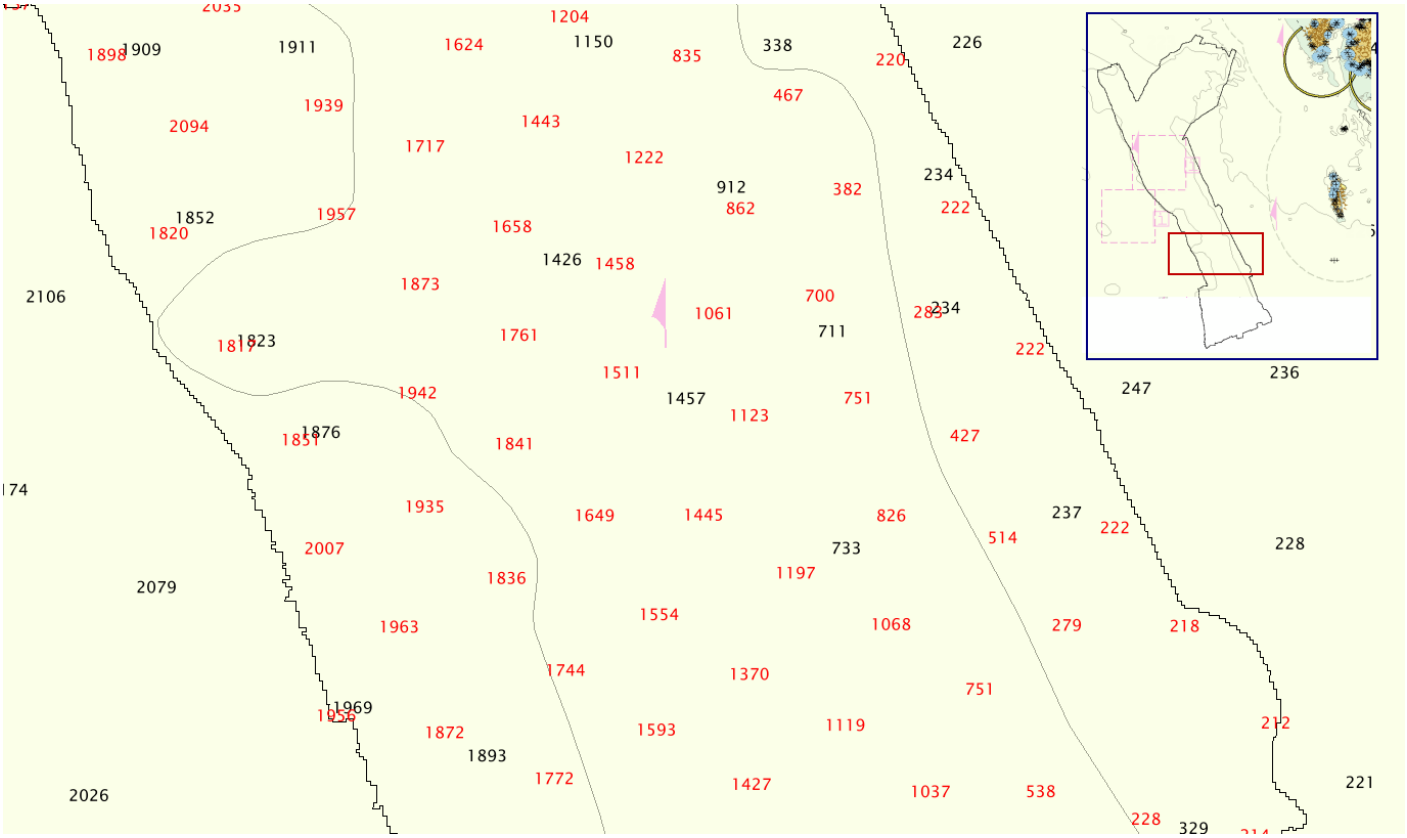


Figure 10: D00245 surveyed soundings (in red) compared to US3AK40M charted soundings (in black)

US1WC01M

US1WC01M contains a negligible soundings within the survey area, and no soundings in the southern portion of D00245, which does not overlap with US3AK40M (Figure 11). The hydrographer recommends adding surveyed data to this chart.

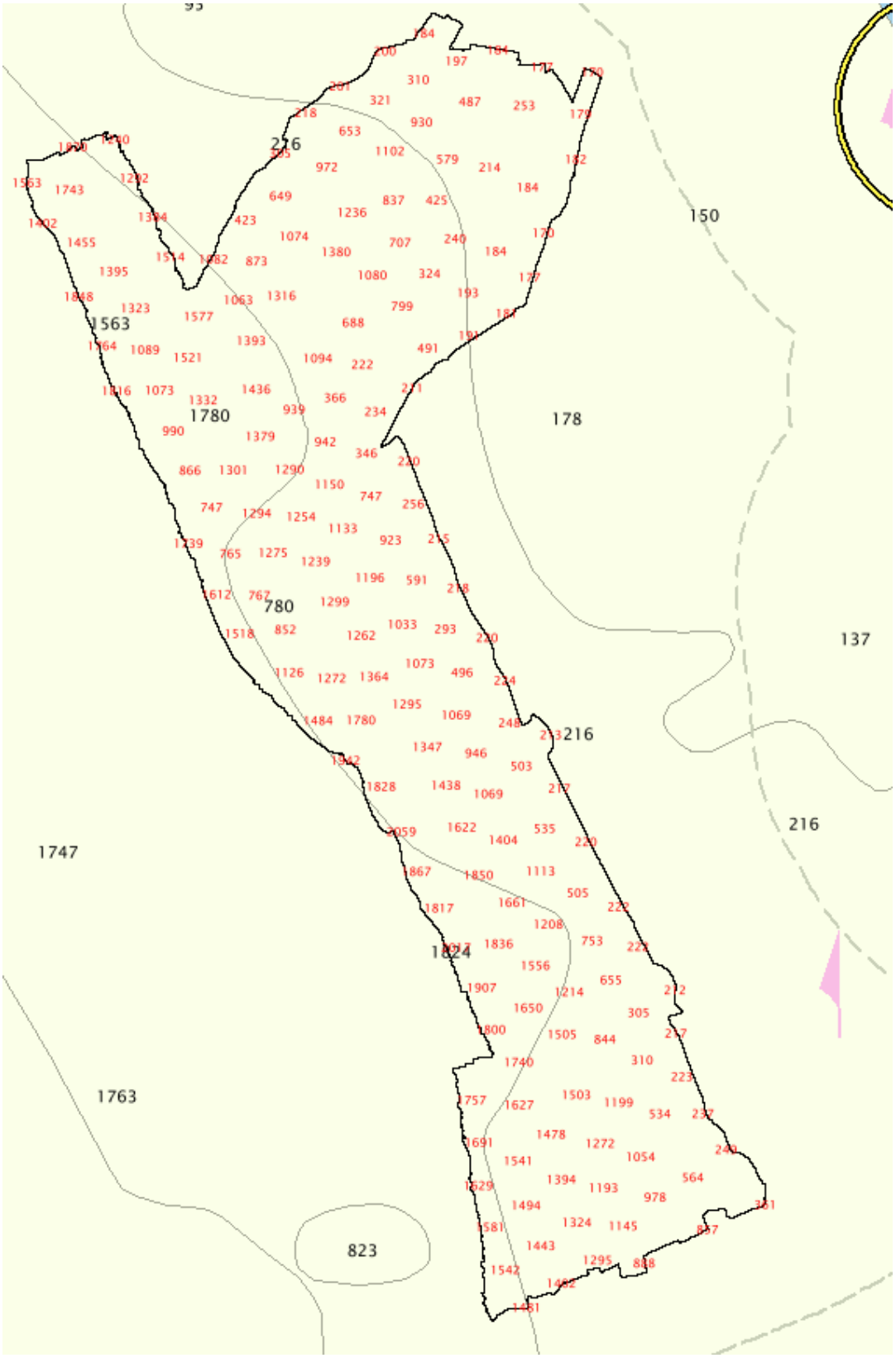


Figure 11: D00245 surveyed soundings (in red) compared to US1WC01M charted soundings (in black)

D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.3 Charted Features

No charted features exist for this survey.

D.1.4 Uncharted Features

No uncharted features exist for this survey.

D.1.5 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.6 Channels

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

D.1.7 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

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

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

No Aids to navigation (ATONs) exist for this survey.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Platforms

No platforms exist for this survey.

D.2.7 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.8 Abnormal Seafloor and/or Environmental Conditions

No abnormal seafloor and/or environmental conditions exist for this survey.

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits.

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 Specifications and Deliverables, 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 herein.

Approver Name	Approver Title	Approval Date	Signature
CDR Mark Van Waes	Commanding Officer	07/31/2018	VAN WAES.MARK.1240076329 2018.08.01 14:55:44 -08'00'
LT Damian Manda	Field Operations Officer	07/31/2018	MANDA.DAMIAN.CURTIS.1396610660 2018.07.31 23:52:57 -08'00'
HCST Sam Candio	Chief Survey Technician	07/31/2018	Digitally signed by CANDIO.SAMUEL.LOUIS.1515897743 Date: 2018.07.31 16:18:26 -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 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
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	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
PRF	Project Reference File

Acronym	Definition
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 Stated Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positiong System timing message
ZDF	Zone Definition File

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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : July 6, 2018

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O190-FA-2018
HYDROGRAPHIC SHEET: D00245

LOCALITY: Noyes Canyon
Southeast Alaska
TIME PERIOD: April 25 - June 29, 2018

TIDE STATION USED: Ketchikan, AK (9450460)
Lat. 55° 19.9' N Long. 131° 37.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.433 meters

TIDE STATION USED: Port Alexander, AK (9451054)
Lat. 56° 14.8' N Long. 134° 38.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.070 meters

TIDE STATION USED: Sitka, AK (9451600)
Lat. 57° 3.1' N Long. 135° 20.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

TIDE STATION USED: Juneau, AK (9452210)
Lat. 58° 17.9' N Long. 134° 24.7' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.676 meters

TIDE STATION USED: Skagway, AK (9452400)
Lat. 59° 27.0' N Long. 135° 19.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.795 meters

TIDE STATION USED: Elfin Cove, AK (9452634)
Lat. 58° 11.7' N Long. 136° 20.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.088 meters

REMARKS: RECOMMENDED Grid

Please use the TCARI grid "O190_O360_O375_O392_FA2018.tc" as the final grid for project OPR-O190-FA-2018, D00245, during the time period between April 25 and June 29, 2018.

Refer to attachments for grid 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: Annual leveling for Ketchikan (9450460), Port Alexander (9451054), Sitka (9451600), Juneau (9452210) and Elfin Cove (9452634) was not completed in FY18. A review of the verified leveling records from October 2007 - 2017 shows the tide station benchmark networks to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for survey OPR-O190-FA-2018, D00245. 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.

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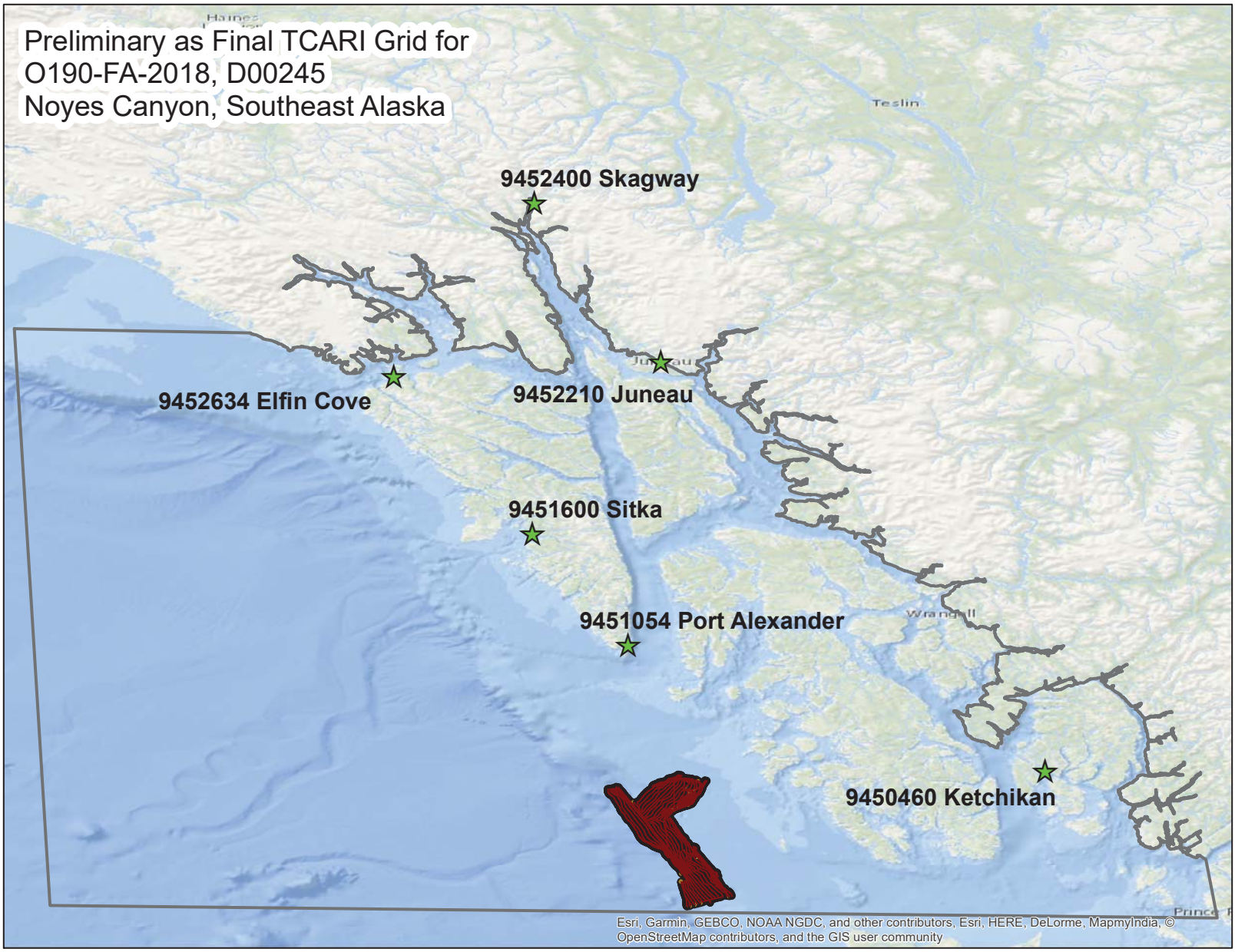
CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary as Final TCARI Grid for
O190-FA-2018, D00245
Noyes Canyon, Southeast Alaska
9452400 Skagway
9452634 Elfin Cove
9452210 Juneau
9451600 Sitka
9451054 Port Alexander
9450460 Ketchikan
Esri, Garmin, GEBCO, NOAA NGDC, and other contributors, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Marine and Aviation Operations
NOAA Ship *Fairweather* (S220)
1010 Stedman Street, Ketchikan, Alaska 99901

April 25, 2018

MEMORANDUM FOR: Meredith Payne
Project Manager, OPR-O190-FA-18
Hydrographic Surveys Division Operations Branch

FROM: Commander Mark Van Waes, NOAA
Commanding Officer, NOAA Ship *Fairweather*

SUBJECT: Waiver Request – Adjustment of Sheet Limits for D00245, Noyes Canyon

Fairweather requests a waiver to adjust the sheet limits for sheet D00245 within the project OPR-O190-FA-18 in response to a request from the science party representing the United States Geological Survey (USGS).

Justification

In an effort to ensure that the highest quality product providing optimal customer satisfaction is delivered to the USGS, *Fairweather* consulted with the USGS science party funding the majority of this project to determine what would constitute a successful mission. The science party provided a polygon highlighting the area they have determined to be the highest priority, focusing primarily on the vicinity of the Queen Charlotte Fault. This polygon extends westward of the current sheet limits for D00245 to include the entirety of the fault line and surrounding bathymetry. Attached to this request is an image showing the current sheet limits, the USGS area of highest priority, and the location of the fault itself. *Fairweather* requests to amend the current sheet limits to include this area, with the intention of acquiring the remainder of the currently assigned polygon as time permits.

Decision

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=PAYNE.MEREDITH.CLAIRE.1536084572
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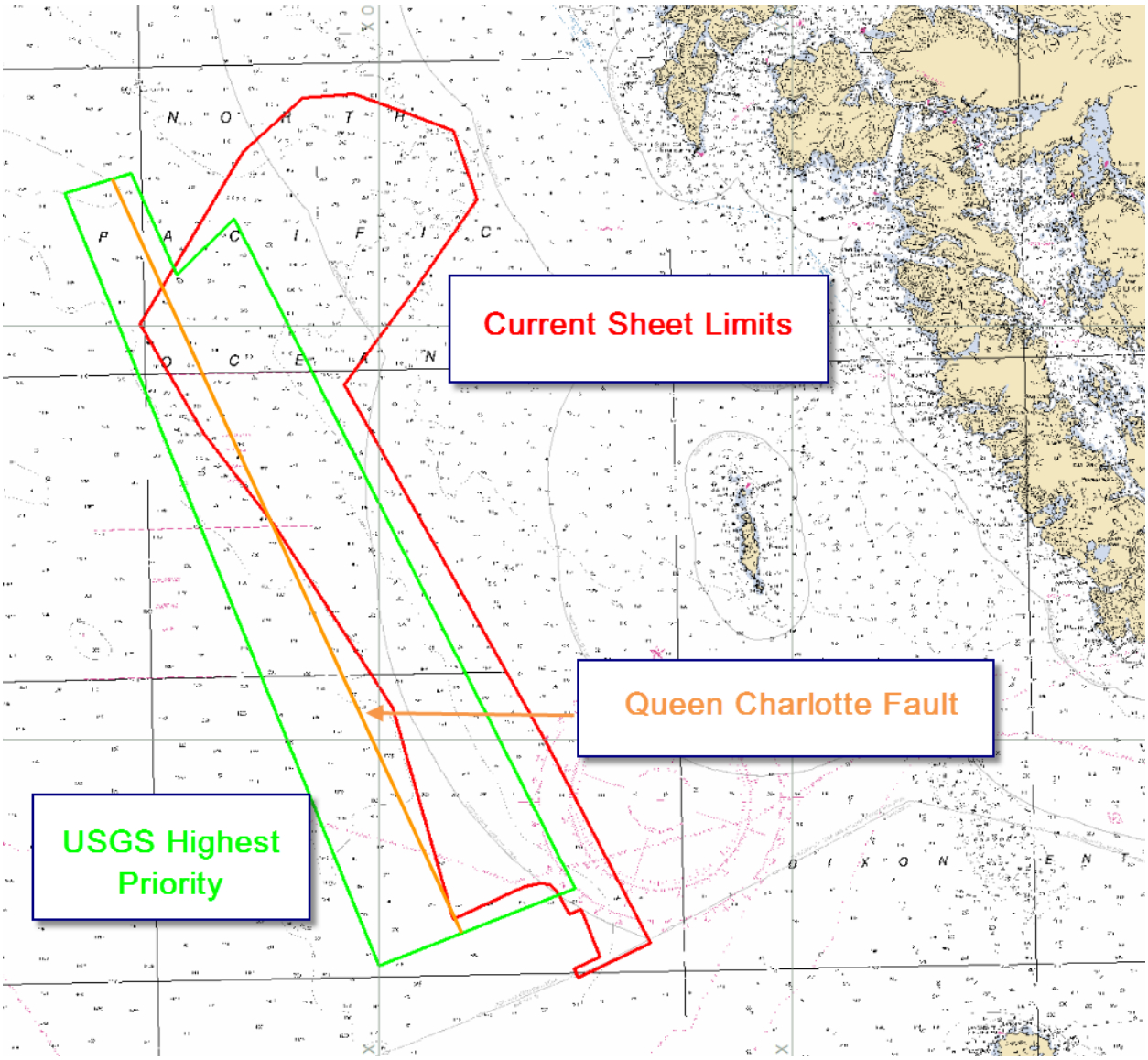
Waiver is: Granted _____ Denied _____

cc: Chief, HSD OPS
OPS, FA
HCST, FA


Current Sheet Limits
Queen Charlotte Fault
USGS Highest Priority

APPROVAL PAGE

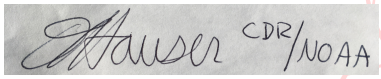
D00245

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 NCEI for archive

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- Processed survey data and records
- GeoPDF of survey products

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



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Approved:_____

Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch