H13208

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13208

LOCALITY

State(s):	California
General Locality:	Channel Islands, CA
Sub-locality:	Posa Anchorage to Fraser Point

2019

CHIEF OF PARTY
CAPT Marc Moser

LIBRARY & ARCHIVES

Date:

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

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H13208

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):	**California**
General Locality:	**Channel Islands, CA**
Sub-Locality:	**Posa Anchorage to Fraser Point**
Scale:	**20000**
Dates of Survey:	**10/12/2019 to 10/14/2019**
Instructions Dated:	**08/27/2019**
Project Number:	**OPR-L397-FA-19**
Field Unit:	**NOAA Ship *Fairweather***
Chief of Party:	**CAPT Marc Moser**
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/.

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Descriptive Report to Accompany Survey H13208

Project: OPR-L397-FA-19

Locality: Channel Islands, CA

Sublocality: Posa Anchorage to Fraser Point

Scale: 1:20000

October 2019 - October 2019

NOAA Ship *Fairweather*

Chief of Party: CAPT Marc Moser

A. Area Surveyed

The survey area is located between Posa Anchorage and Fraser Point, CA

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
34° 3' 33" N 119° 58' 26.65" W	33° 58' 49.72" N 119° 52' 29.48" W

Table 1: Survey Limits

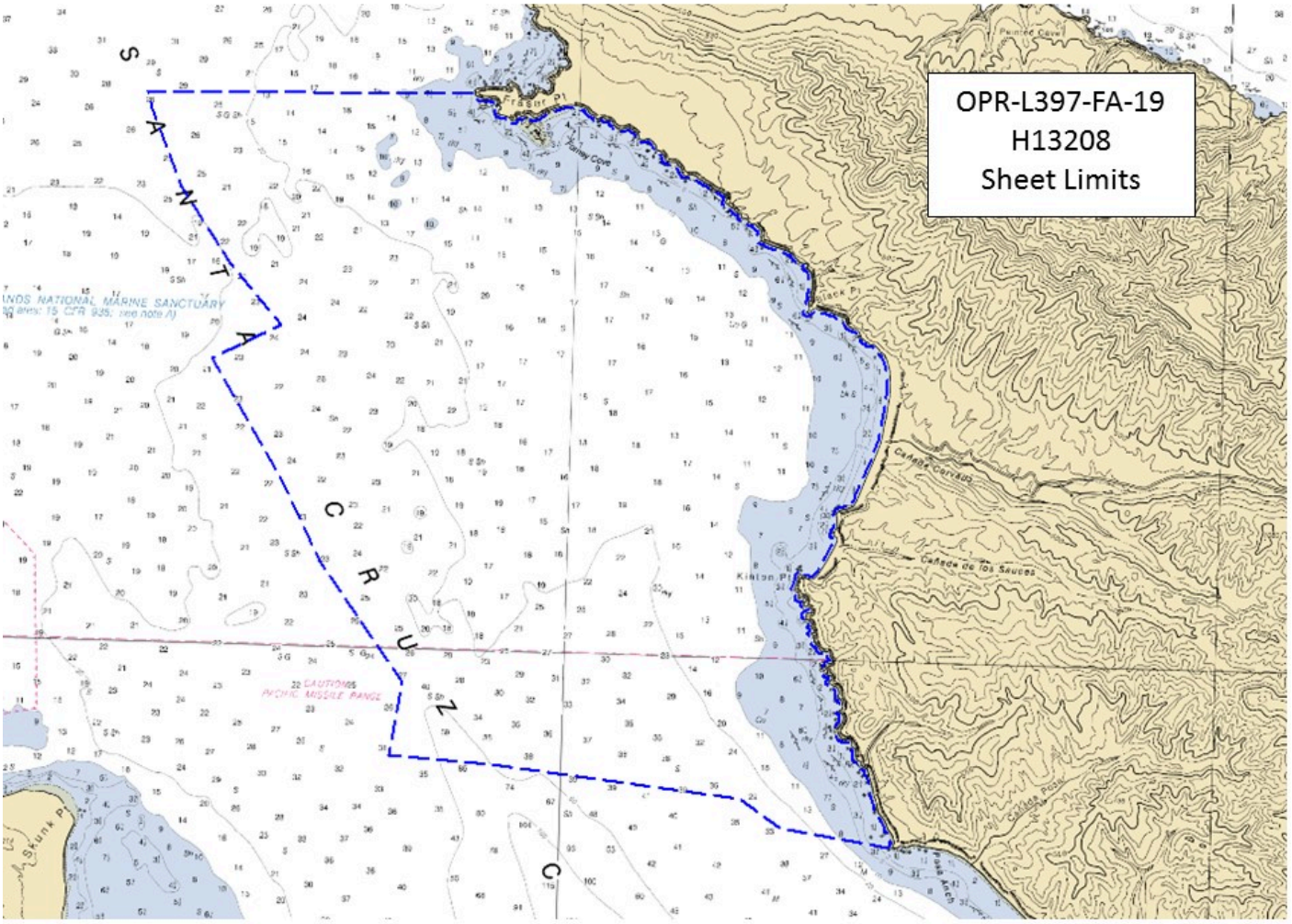


Figure 1: H13208 sheet limits (in blue) overlaid onto Chart 18728

Data were acquired to the survey limits in accordance with the requirements in the Project Instructions and the March 2019 NOS Hydrographic Surveys Specifications and Deliverables (HSSD) as shown in Figure 1. In all areas where the 3.5 meter depth contour or the sheet limits were not met, the Navigable Area Limit Line (NALL) was defined as the inshore limit of bathymetry due to kelp, the risks of maneuvering around anchored vessels, or in close proximity to the steep and rocky shoreline. An example of such an area is shown in Figure 2.

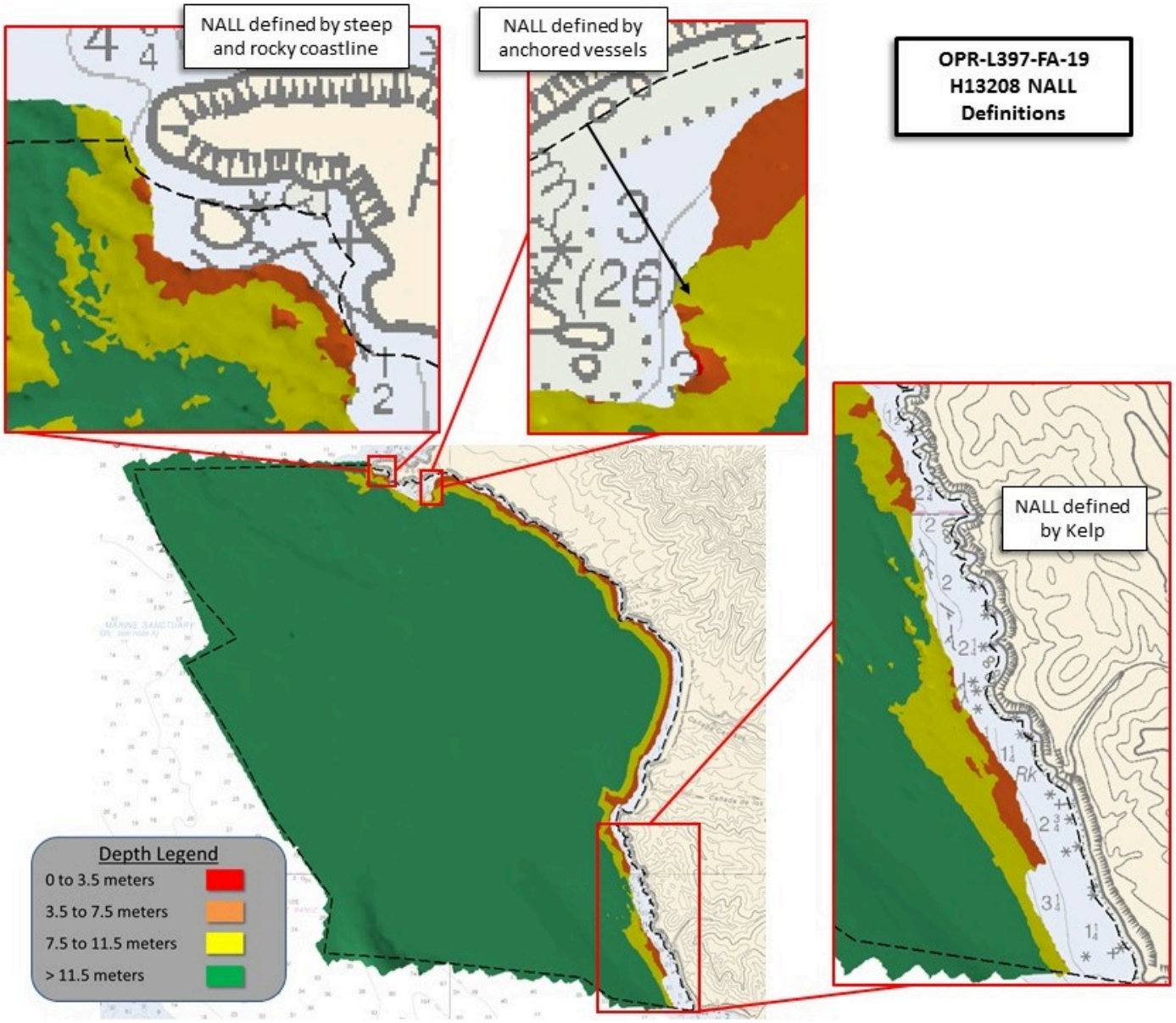


Figure 2: Areas where the NALL was defined by the presence of kelp or the risks of maneuvering around anchored vessels and the steep and rocky shoreline.

A.2 Survey Purpose

This year the Channel Islands National Marine Sanctuary work will focus on the remaining survey area around Santa Cruz Island, the largest of the Channel Islands (about 97 sq. mi.), located about 30 miles offshore of the California mainland city of Santa Barbara. The waters surrounding CINMS are highly productive and are home to recreational and commercial fishing efforts, and regularly host kayakers, surfers, sightseers, whale watchers, researchers, and Channel Islands National Park concessionaires, who all access the sanctuary via boats. Correspondingly, the abundance of sea life and aquatic habitats drives a thriving industry of recreational and commercial fishing that brings varied vessel traffic through the waters of

CINMS. The commercial fishing vessel traffic alone is responsible for the highest commercial landings value (approximately $450 million; 2005-2015) across all of California's ports. Additionally, major mainland port traffic transiting to and from Los Angeles and Long Beach, California routes large cargo and tanker vessels close to CINMS boundaries. Much of the existing nautical chart data dates back to 1930s lead line or single beam echo sounder surveys, and the areas not surveyed to modern standards are predominantly located in the shallow waters (<40m) where vessel traffic is highest. This poses a serious risk to life, property, and the delicate ecosystem with 64 groundings since 2000. Increasing traffic is increasing the risk, with seven of those groundings in 2015 alone. Modern survey efforts, such as a 2015 survey by NOAA Ship Bell M. Shimada, have found previously undetected pinnacles within the sanctuary. This survey will continue modern mapping efforts to identify any similar threats that may exist in these waters. The CINMS hydrographic survey will be as unique as the region itself. In addition to providing data for crucial nautical chart updates, this survey will also generate backscatter data, which will be used in habitat mapping and substrate analysis. Both multibeam echo sounder and backscatter data will not only serve to enhance marine navigational safety, but will also be used by sanctuary managers, planners, and researchers, aiding them in the conservation of this most precious resource. Survey data from this project is intended to supersede all prior survey data in the common area.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired in H13208 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.2.09), and density requirements (see Section B.2.10).

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 in survey area	Complete Coverage

Table 2: Survey Coverage

The entirety of H13208 was acquired with Complete Coverage, meeting the requirements listed above and in the HSSD. See Figure 3 for an overview of coverage.

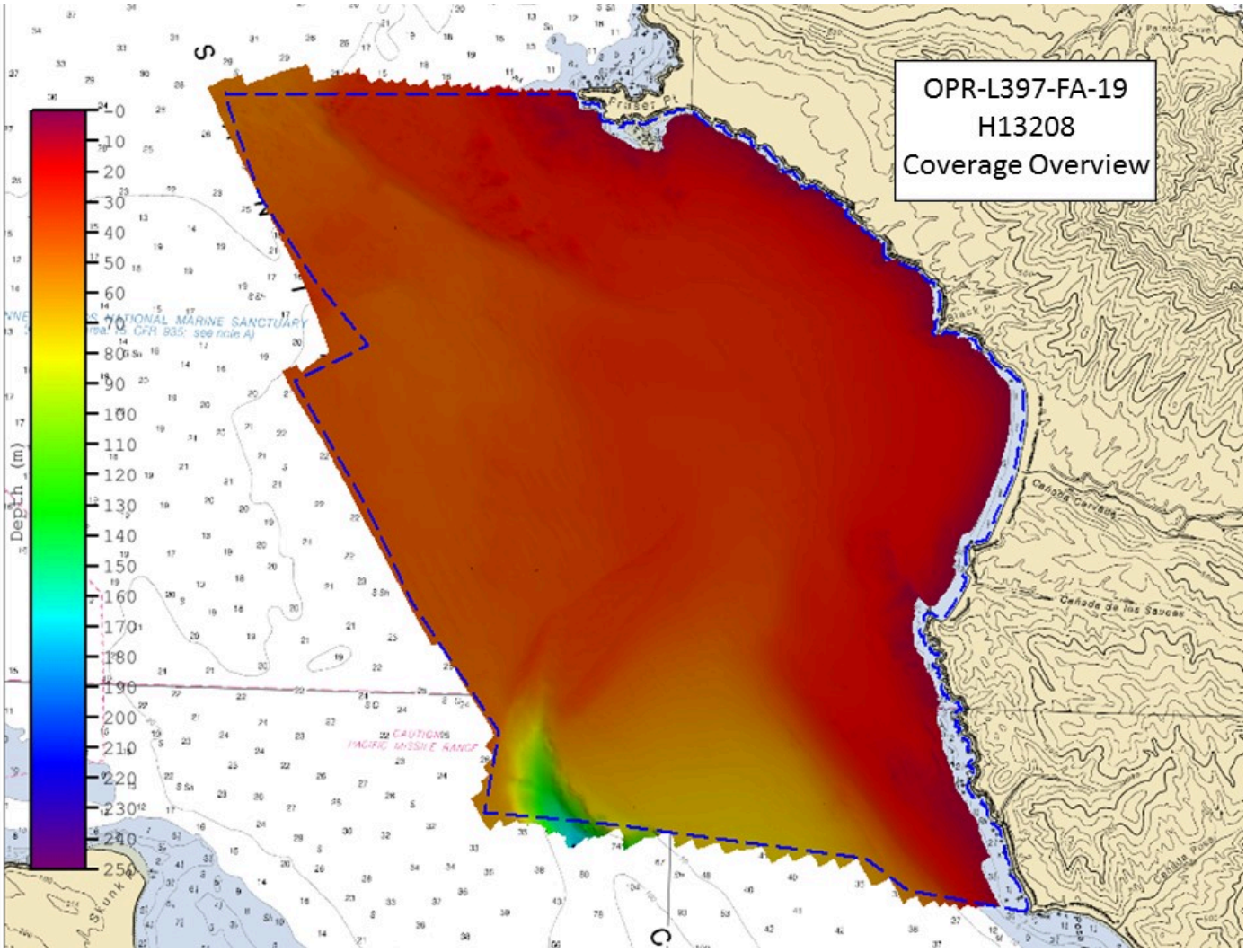


Figure 3: H13208 survey coverage overlaid onto Chart 18728

A.6 Survey Statistics

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

	HULL ID	*2807*	*2806*	*2805*	*2808*	*Total*
LNM	SBES Mainscheme	0	0	0	0	0
	MBES Mainscheme	116.72	62.26	61.44	110.12	350.54
	Lidar Mainscheme	0	0	0	0	0
	SSS Mainscheme	0	0	0	0	0
	SBES/SSS Mainscheme	0	0	0	0	0
	MBES/SSS Mainscheme	0	0	0	0	0
	SBES/MBES Crosslines	5.50	0.81	0	9.26	15.57
	Lidar Crosslines	0	0	0	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						15.09

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
10/12/2019	285
10/13/2019	286

Survey Dates	Day of the Year
10/14/2019	287

Table 4: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the OPR-L397-FA-19 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	*2805*	*2808*	*2806*	*2807*
LOA	8.6 meters	8.6 meters	8.6 meters	8.6 meters
Draft	1.1 meters	1.1 meters	1.1 meters	1.1 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 2040	MBES
Sea-Bird Scientific	SBE 19plus V2	Conductivity, Temperature, and Depth Sensor
Applanix	POS MV 320 v5	Positioning and Attitude System
Teledyne RESON	SVP 71	Sound Speed System

Table 6: Major Systems Used

The equipment was installed on the survey platform as follows: Each launch utilizes the Kongsberg EM 2040 MBES, a POS MV v5 system for position and attitude, SVP 71 surface sound speed sensors, and SBE 19plus V2 for conductivity, temperature, and depth (CTD) casts.

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 4.44% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with Section 5.2.4.2 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 4), and is submitted in the Separates II Digital Data folder. Statistics show the mean difference between depths derived from mainscheme data and crossline data was 0.02 meters (with mainscheme being shoaler) and 95% of nodes falling within +/- 0.26 meters (Figure 5). For the respective depths, the difference surface was compared to the allowable NOAA uncertainty standards. In total, 99.93% of the depth differences between H13208 mainscheme and crossline data were within allowable NOAA uncertainties.

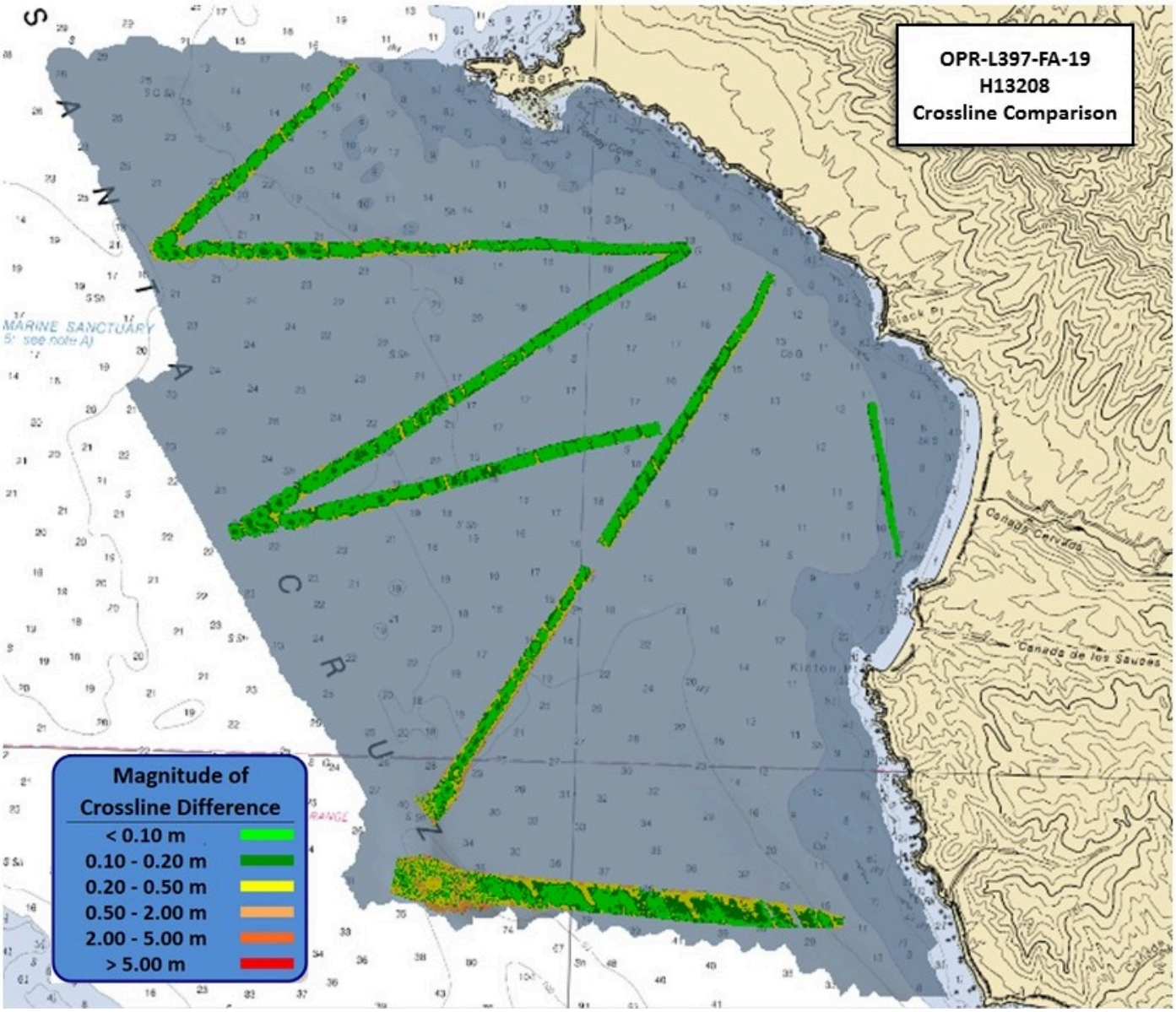
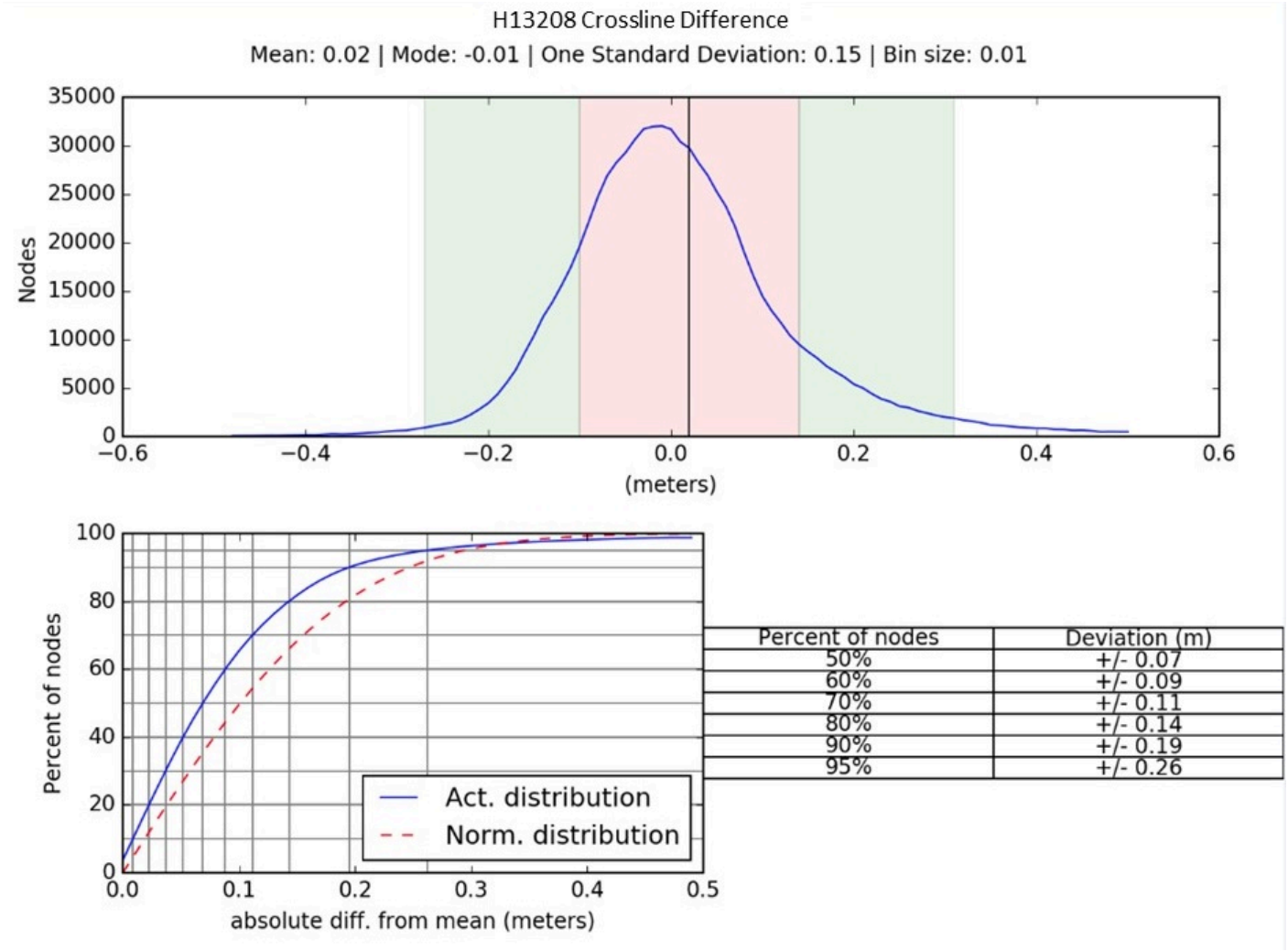


Figure 4: Overview of H13208 crosslines



Percent of nodes	Deviation (m)
50%	+/- 0.07
60%	+/- 0.09
70%	+/- 0.11
80%	+/- 0.14
90%	+/- 0.19
95%	+/- 0.26

Figure 5: H13208 Crossline and maincheme difference statistics

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM		7.8 centimeters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
280X	2 meters/second	N/A	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

In addition to the usual a priori estimates of uncertainty via device models for vessel motion and VDATUM, real-time and post-processed uncertainty sources were also incorporated into the depth estimates of survey H13208. Real-time uncertainties were provided via EM 2040 MBES data and Applanix Delayed Heave RMS. 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

H13208 junctions with 2 adjacent surveys from this project, H13209, H13325 and 1 survey from prior projects, H13205 as shown in Figure 6. Data overlap between H13208 and each adjacent survey was achieved. These areas of overlap between surveys were reviewed in CARIS HIPS and SIPS by surface differencing (at equal resolutions) to assess surface agreement. The multibeam data were also examined in CARIS Subset Editor for consistency and agreement. The junctions with H13208 are generally within the NOAA allowable uncertainty in their areas of overlap. For all junctions with H13208, a negative difference indicates H13208 was shoaler and a positive difference indicates H13208 was deeper.

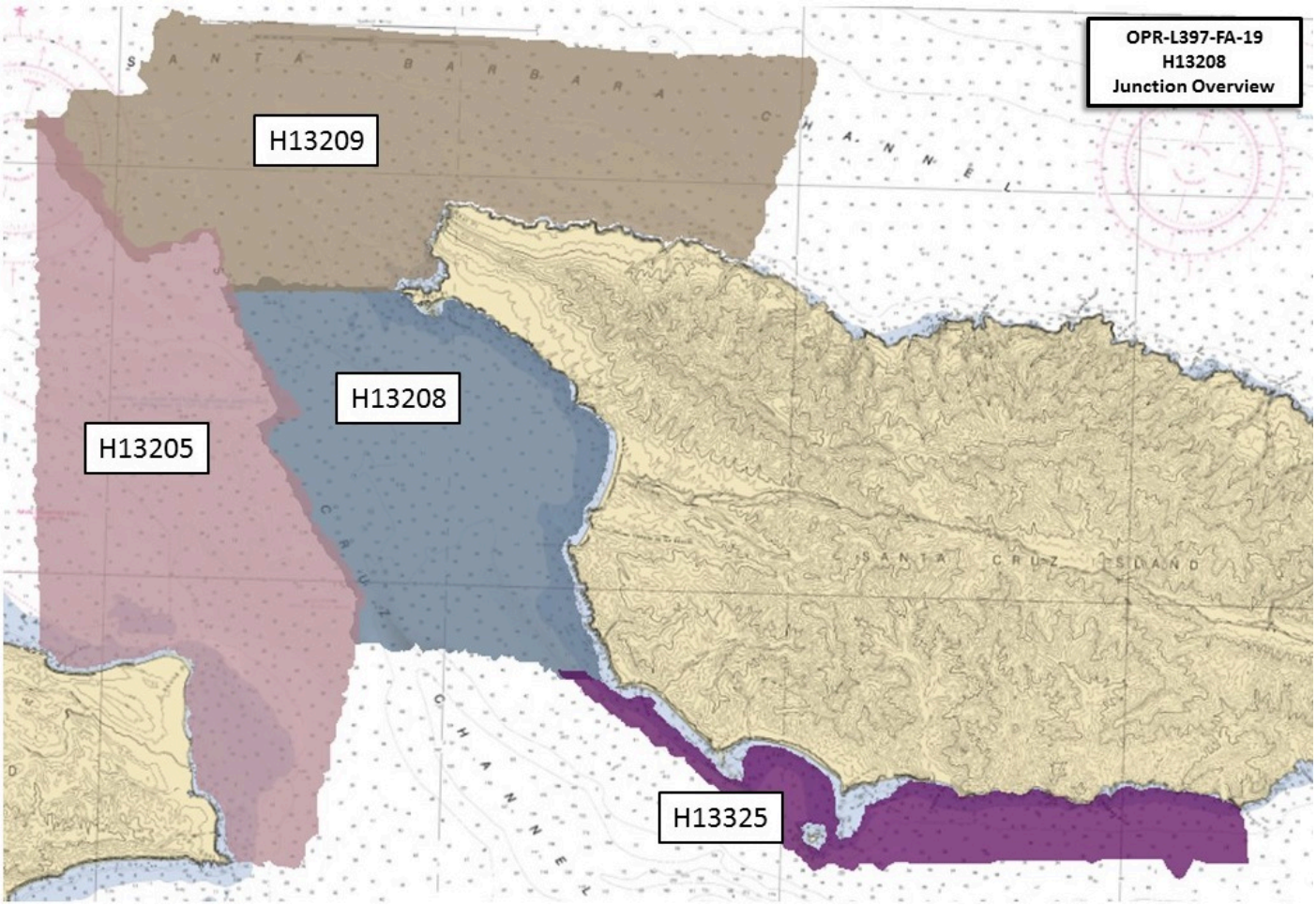


Figure 6: Overview of H13208 junction surveys

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13209	1:20000	2019	NOAA Ship FAIRWEATHER	N
H13325	1:20000	2019	NOAA Ship FAIRWEATHER	SE
H13205	1:20000	2018	NOAA Ship RAINIER	W

Table 9: Junctioning Surveys

H13209

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the surface from H13208 and the surface from H13209 (Figure 7). The statistical analysis of the difference surface

shows a mean of 0.05 meters with 95% of the nodes having a maximum deviation of +/- 0.34 meters, as seen in Figure 8. It was found that 99.85% of nodes are within NOAA allowable uncertainty.

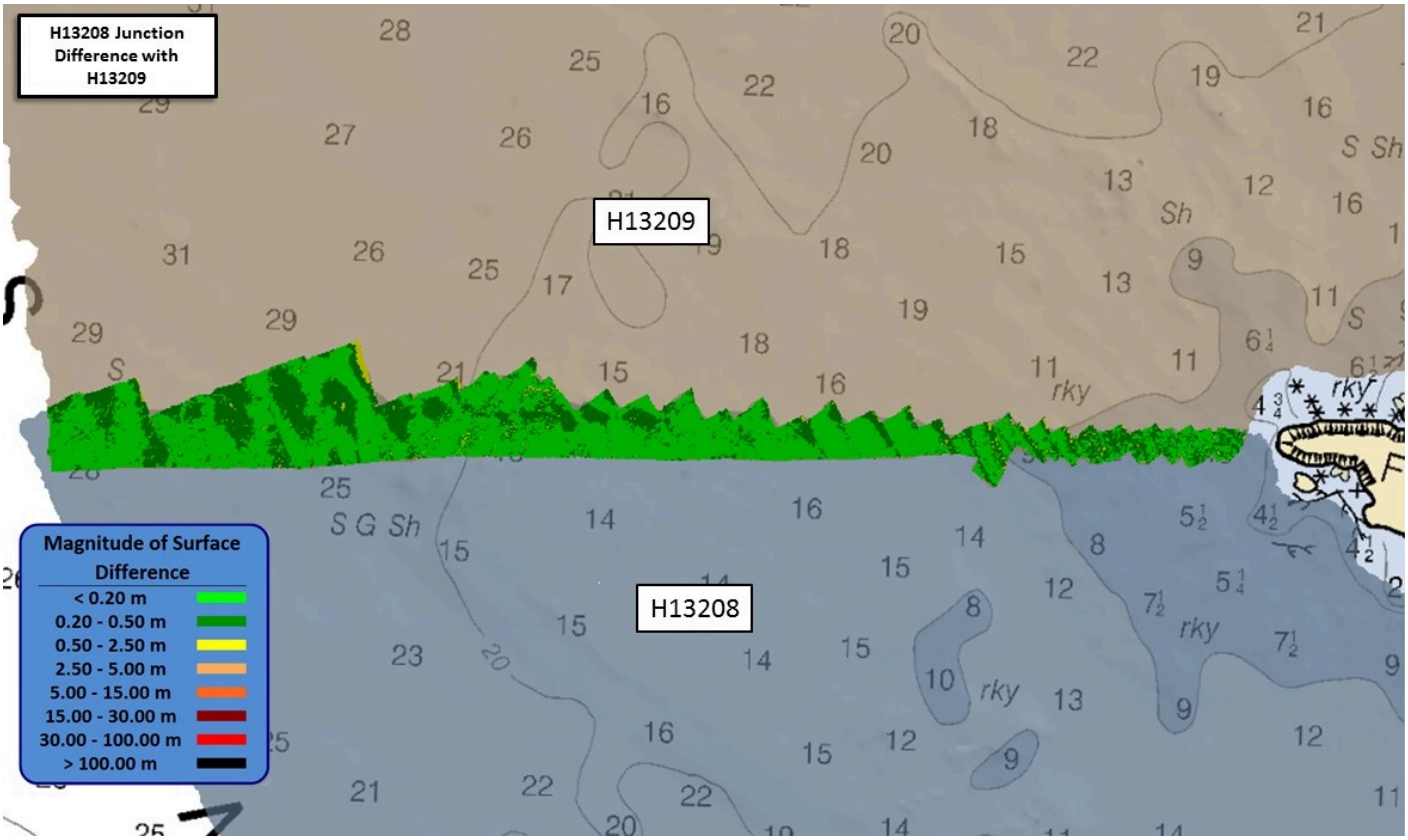
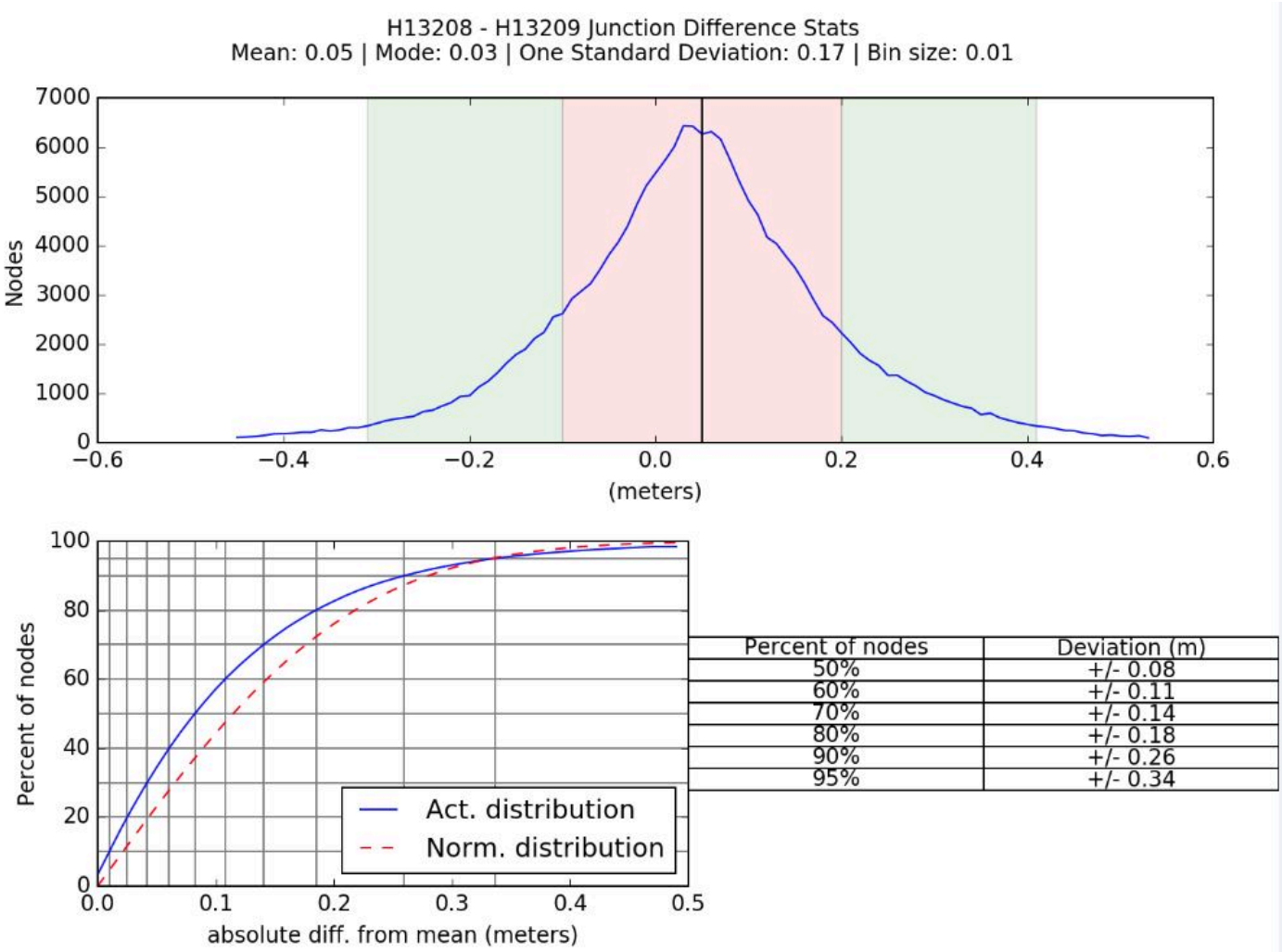


Figure 7: Difference surface between H13208 (gray) and junctioning survey H13209 (brown)



Percent of nodes	Deviation (m)
50%	+/- 0.08
60%	+/- 0.11
70%	+/- 0.14
80%	+/- 0.18
90%	+/- 0.26
95%	+/- 0.34

Figure 8: Difference surface statistics between H13208 and H13209 (VR surface)

H13325

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the surface from H13208 and the surface from H13325 (Figure 9). The statistical analysis of the difference surface shows a mean of 0.04 meters with 95% of the nodes having a maximum deviation of +/- 0.17 meters, as seen in Figure 10. It was found that 99.99% of nodes are within NOAA allowable uncertainty.

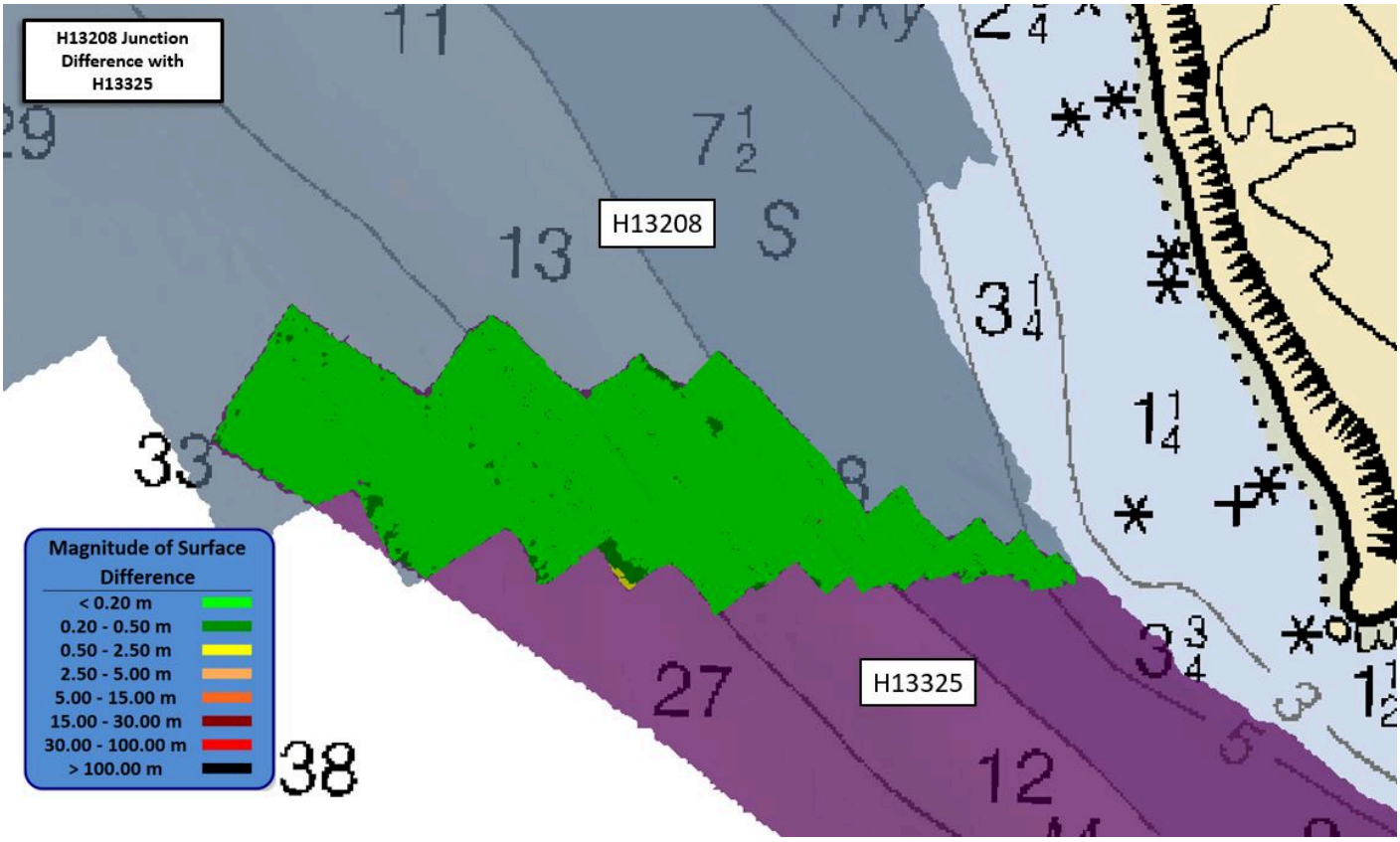
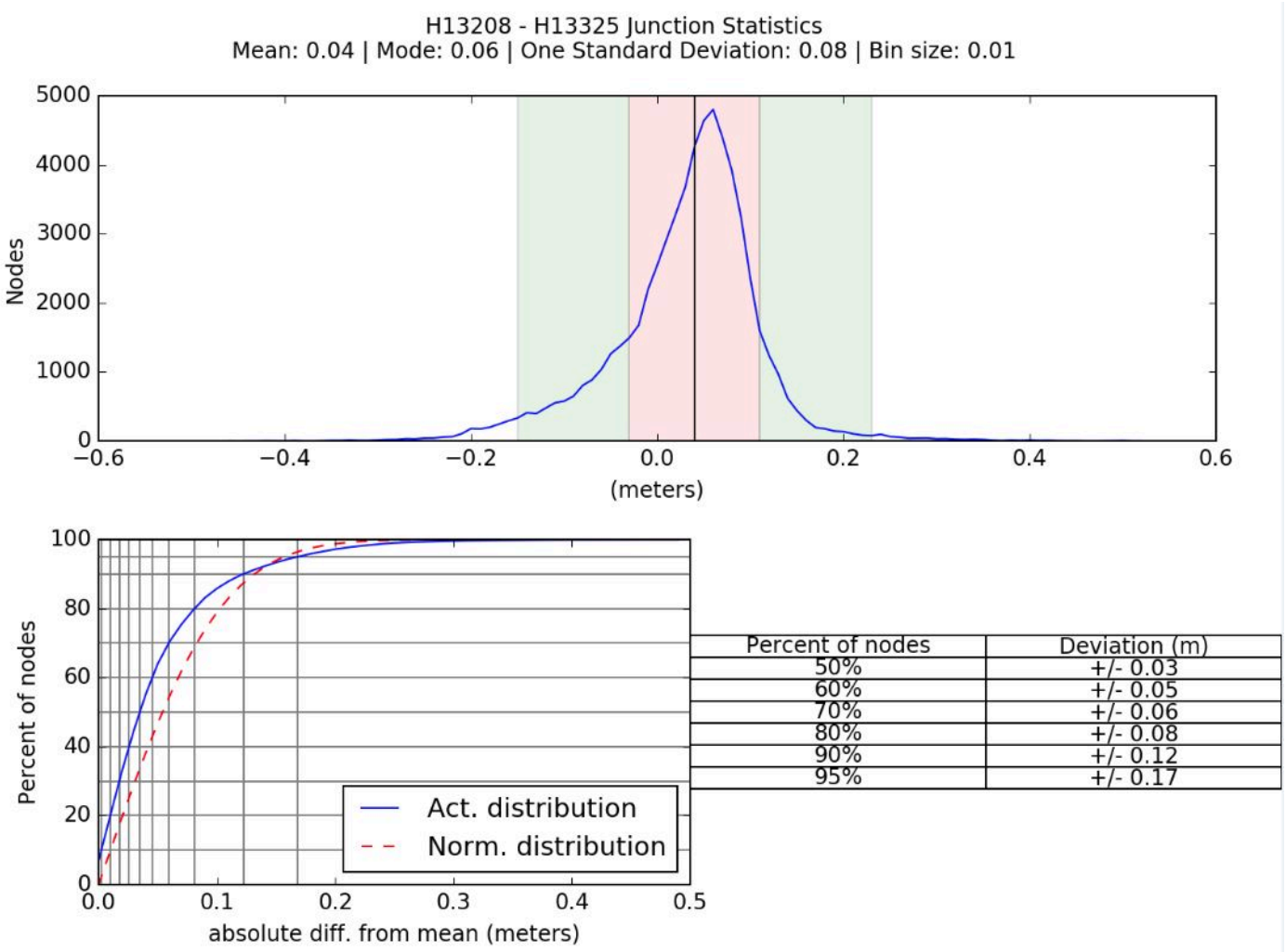


Figure 9: Difference surface between H13208 (gray) and junctioning survey H13325 (purple)



Percent of nodes	Deviation (m)
50%	+/- 0.03
60%	+/- 0.05
70%	+/- 0.06
80%	+/- 0.08
90%	+/- 0.12
95%	+/- 0.17

Figure 10: Difference surface statistics between H13208 and H13325 (VR surface)

H13205

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the surface from H13208 and the surface from H13205 (Figure 11). The statistical analysis of the difference surface shows a mean of 0.11 meters with 95% of the nodes having a maximum deviation of +/- 0.32 meters, as seen in Figure 12. It was found that 99.97% of nodes are within NOAA allowable uncertainty.

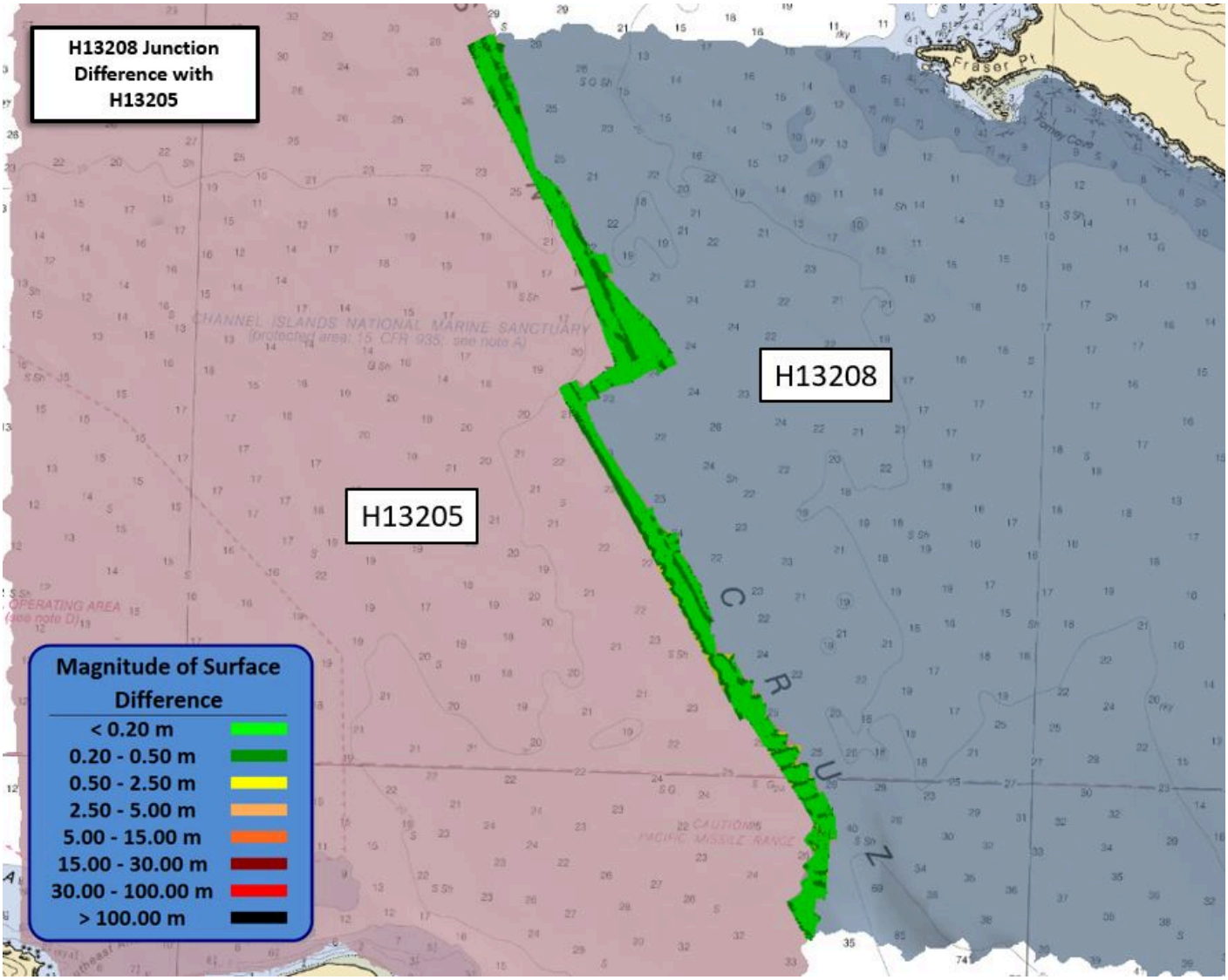
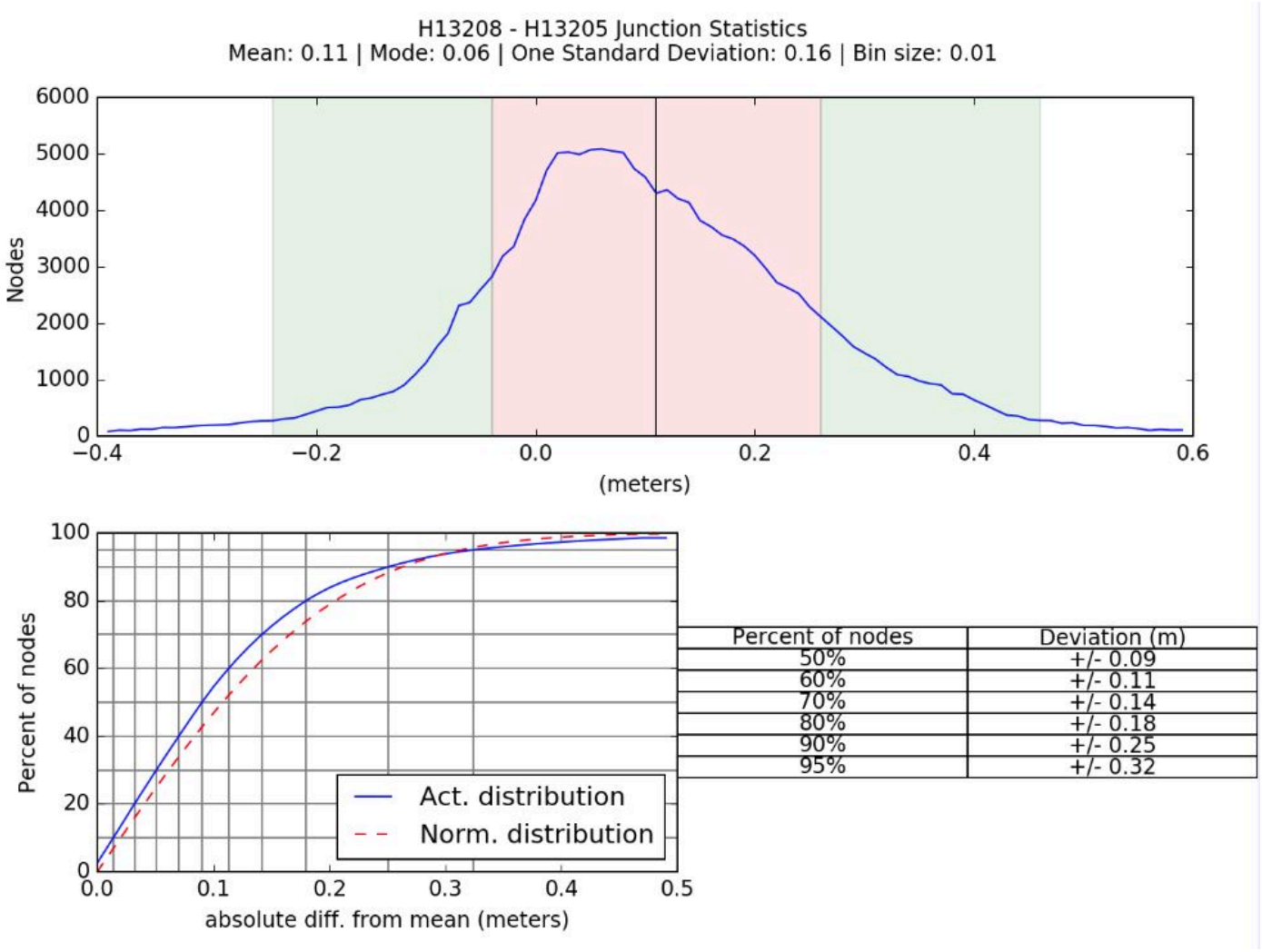


Figure 11: Difference surface between H13208 (gray) and junctioning survey H13205 (pink)



Percent of nodes	Deviation (m)
50%	+/- 0.09
60%	+/- 0.11
70%	+/- 0.14
80%	+/- 0.18
90%	+/- 0.25
95%	+/- 0.32

Figure 12: Difference surface statistics between H13208 and H13205 (VR surface)

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 Issues

In certain areas, particularly the central and southern offshore portions of the survey area, sound speed issues were apparent, visible primarily as "smiles" (see Figure 13). Given the location of the issues, the most probable cause is subsurface mixing that was not modeled on the surface. Surfaces were not significantly impacted and the data still meet NOAA allowable uncertainty parameters from HSSD Section 5.1.3. As such, the data remain sufficient to supersede previous data.

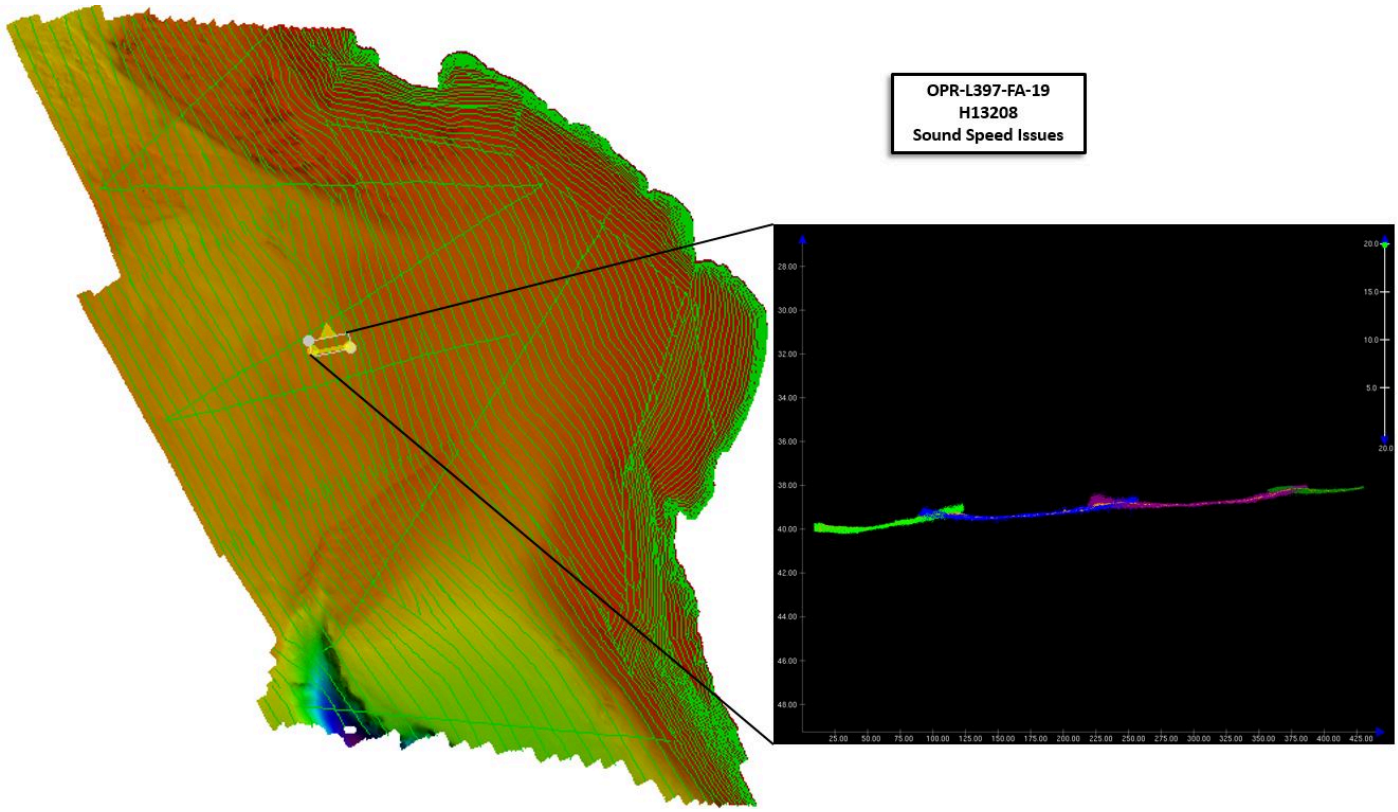


Figure 13: Example of sound speed issues visible in the data exaggerated 20x

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were conducted at a minimum of one every four hours during launch acquisition. Casts were conducted more frequently in areas where the influx of freshwater had an effect on the speed of sound in the water column and when there was a change in surface sound speed greater than two meters per second.

B.2.8 Coverage Equipment and Methods

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

B.2.9 NOAA Allowable Uncertainty

The surface was analyzed using the HydrOffice QC Tools Grid QA feature to determine compliance with specifications. Overall, 99.99% of nodes within the surface meet NOAA Allowable Uncertainty specifications for H13208 (Figure 14).

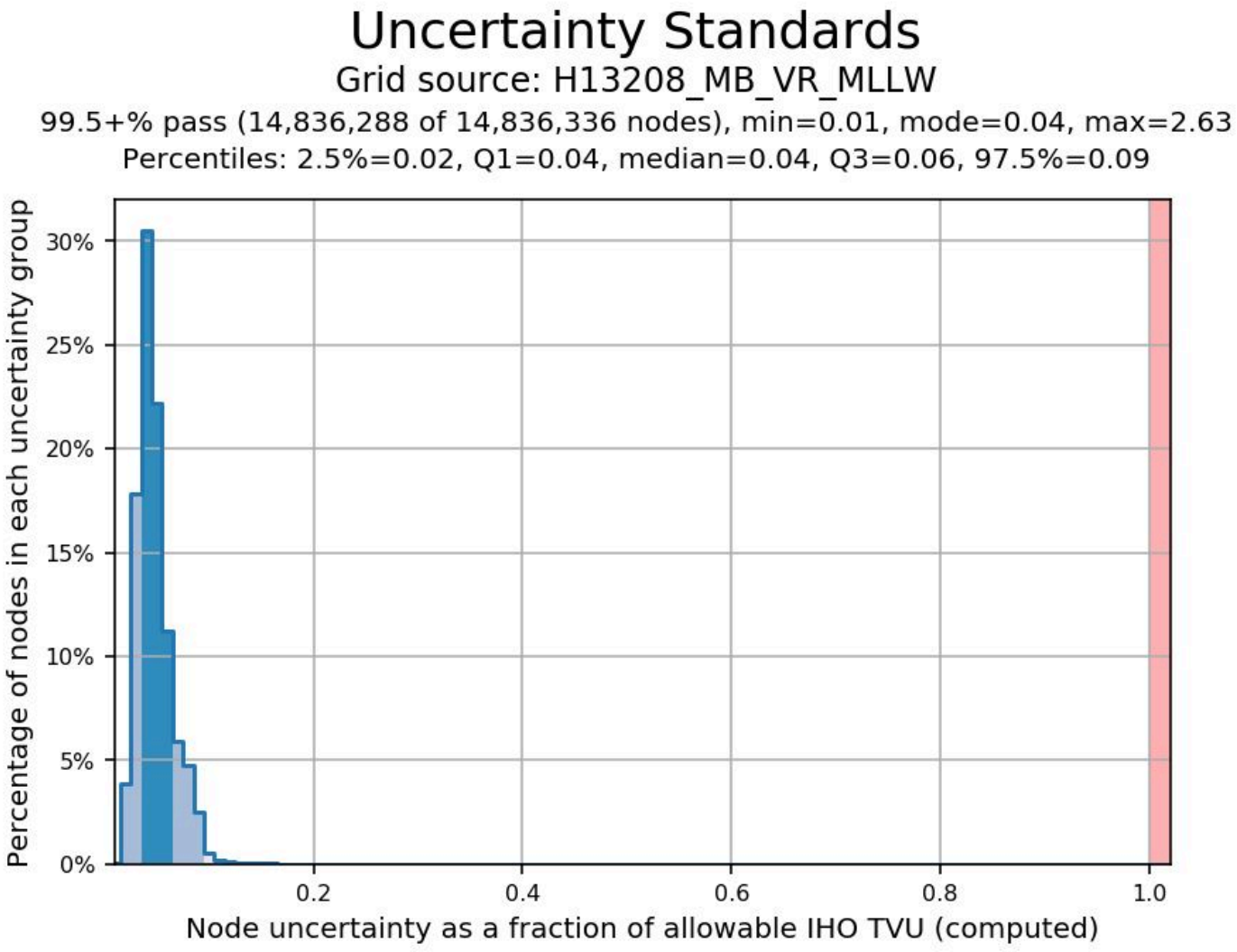


Figure 14: H13208 Allowable uncertainty statistics

B.2.10 Density

The surface was analyzed using the HydrOffice QC Tools Grid QA feature to determine compliance with specifications. Density requirements for H13208 were achieved with at least 99.89% of surface nodes containing five or more soundings as required by HSSD Section 5.2.2.3 (Figure 15).

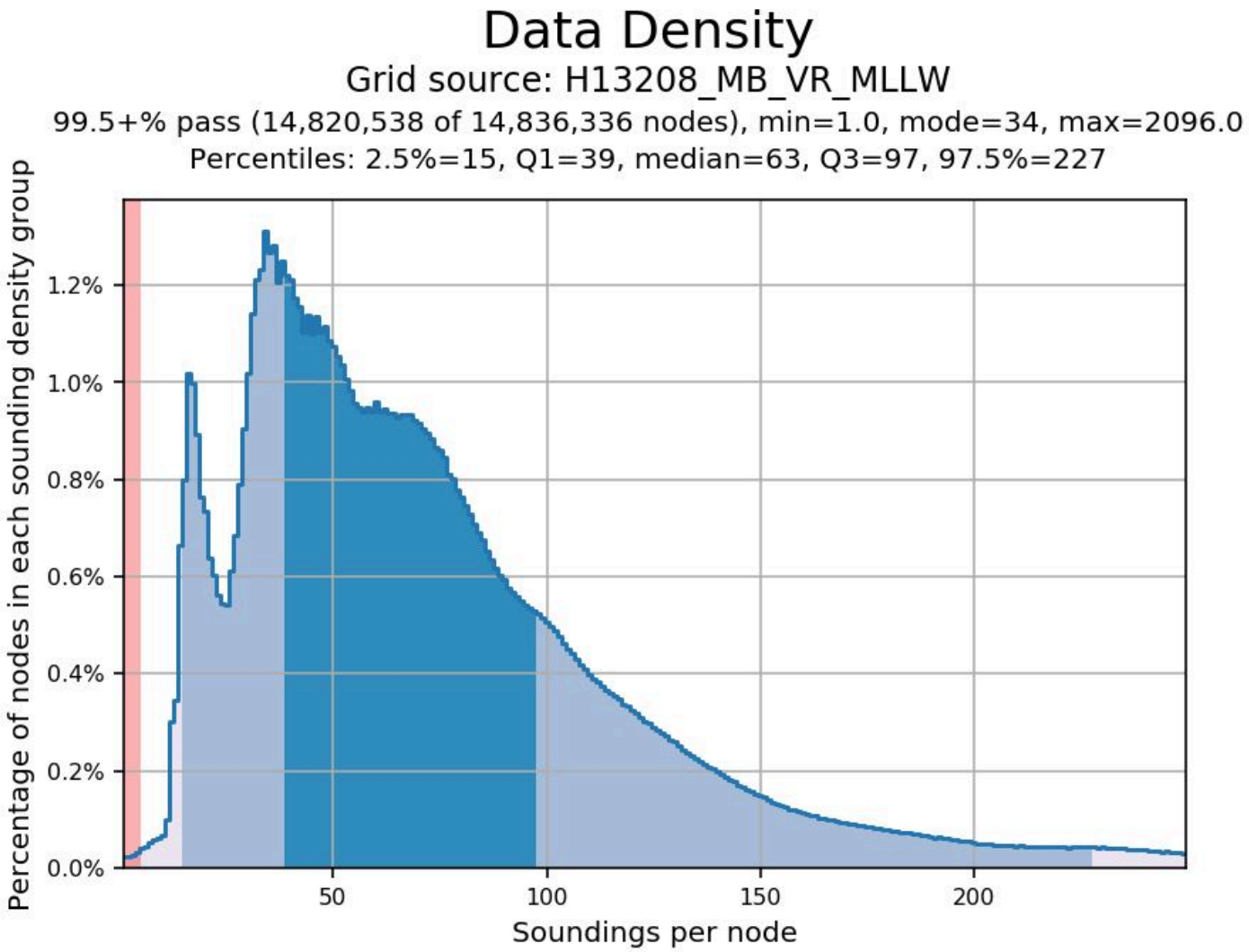


Figure 15: H13208 Data density statistics

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 were stored in the .all file for Kongsberg systems. All backscatter were processed to GSF files and a floating point mosaic was created by the field unit via Fledermaus FMGT 7.8.10. See Figure 16 for a greyscale representation of the complete mosaic. A relative backscatter calibration was performed by HSTB via a patch test in order to bring the survey systems on each of the launches into alignment. See Figure 17 for a table of the calibration values entered into the Processing Settings within FMGT. Approximate inter-calibration corrections for offsets between sonar systems were applied to the mosaic.

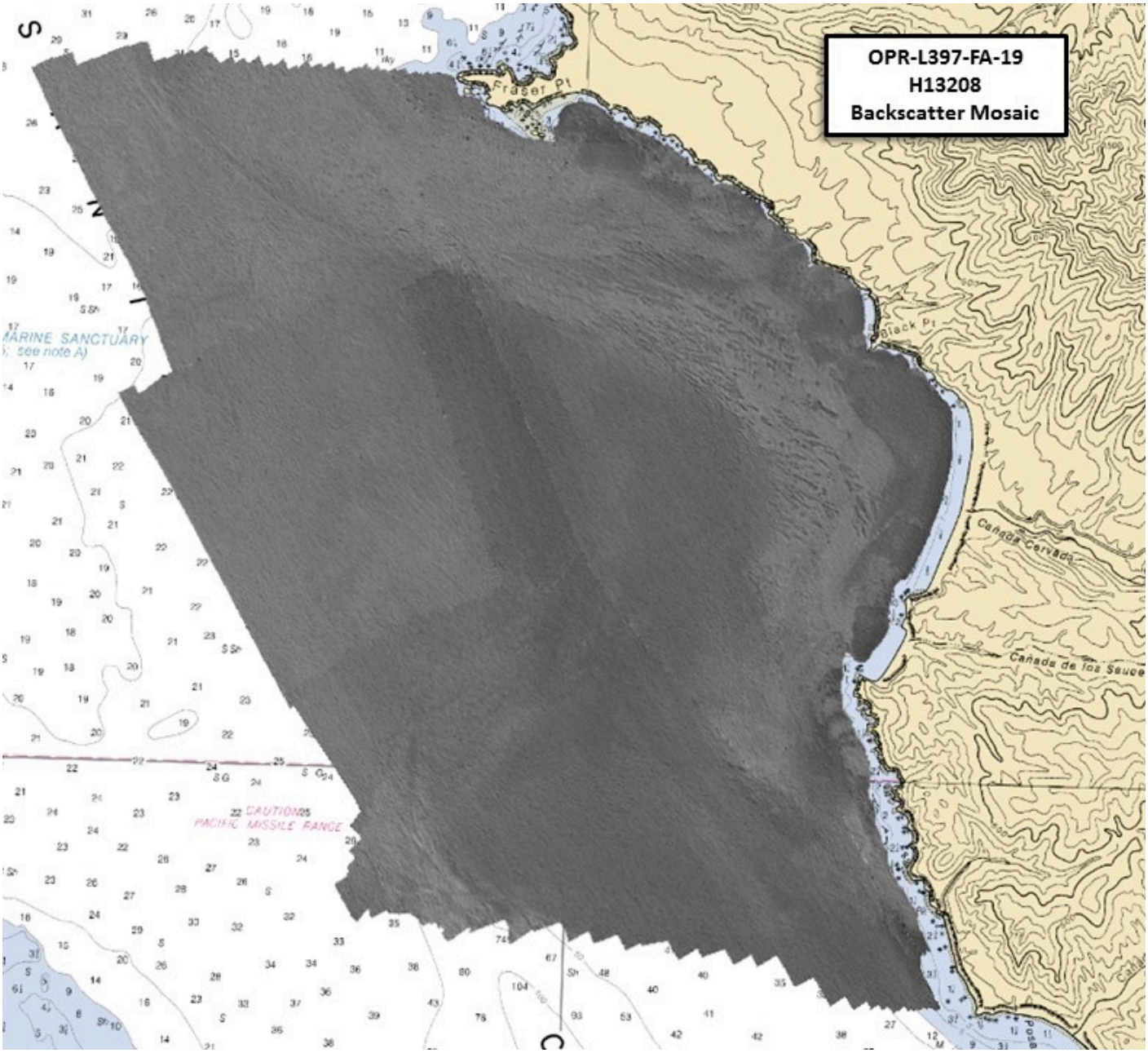


Figure 16: Backscatter mosaic for H13208

	200				300				400		
	Short CW	Med CW	Long CW	FM (Both)	Short CW	Med CW	Long CW	FM (Both)	Short CW	Med CW	Long CW
2805	-1.1	-1.4	-1.8	2.7	-0.7	-0.9	-1.0	-1.4	3	3.9	4.8
2806	1.8	1.8	1.8	2.4	-0.1	-0.3	-0.4	-0.8	3.6	4.65	5.7
2807	-0.3	-0.15	0	0	0	-0.2	-0.3	-0.7	3.3	4.2	5.1
2808	0	0.6	1.2	1.6	-0.3	-0.5	-0.6	-1.0	1.8	2.7	3.6

Figure 17: Backscatter calibration values

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
CARIS	HIPS and SIPS	11.1.3

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	7.8.10

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile Version 2019.

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
H13208_MB_VR_MLLW_final	CARIS VR Surface (CUBE)	Variable Resolution	0.543 meters - 173.218 meters	NOAA_VR	Complete MBES
H13208_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	0.543 meters - 173.218 meters	NOAA_VR	Complete MBES

Table 12: Submitted Surfaces

The NOAA CUBE parameters defined in the HSSD were used for the creation of all CUBE surfaces for H13208. The surfaces have been reviewed where noisy data, or "fliers" are incorporated into the gridded solutions 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, part of the QC Tools package within HydrOffice, 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 surface.

B.5.3 Data Logs

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final separation model reduction and sound speed application are noted in the H13208 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

C. Vertical and Horizontal Control

Per Section 5.1.2.3 of the 2014 Field Procedures Manual, no Horizontal and Vertical Control Report has been generated for H13208.

C.1 Vertical Control

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

ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	OPR-L397-FA-19_100mNAD83-MLLW_geoid12a.csar

Table 13: ERS method and SEP file

ERS methods were used as the final means of reducing H13208 to MLLW for submission.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD 83).

The projection used for this project is Universal Transverse Mercator (UTM) Zone 11.

The following PPK methods were used for horizontal control:

- RTX

Vessel kinematic data were post-processed using Applanix POSPac processing software and RTX positioning 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.

WAAS

During real-time acquisition, all platforms 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 H13208 as no DGPS stations were available for real-time horizontal control.

D. Results and Recommendations

D.1 Chart Comparison

A comparison was performed between survey H13208 and ENC US5CA66M using CARIS HIPS and SIPS. Sounding and contour layers were overlaid on the ENC to assess differences between the surveyed soundings and charted depths. The ENC was compared to the surface by extracting all soundings from the chart and

creating an interpolated TIN surface which could be differenced with the surface from H13208 as shown in Figure 18. Statistical analysis of the difference surface is shown in Figure 19.

All data from H13208 should supersede charted data. In general, surveyed soundings agree with the majority of charted depths. A full discussion 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?
US5CA66M	1:40000	6	05/24/2019	10/04/2019	NO

Table 14: Largest Scale ENCs

US5CA66M

Soundings from H13208 are in general agreement with charted depths on ENC US5CA66M with the exception of the southwest corner of the survey area where differences range to 15 fathoms as seen in Figure 20.

Contours from H13208 are in general agreement with charted contours on ENC US5CA66M as shown in Figure 21. The hydrographer recommends that the 20 fathom contour line be updated to represent the most recent survey.

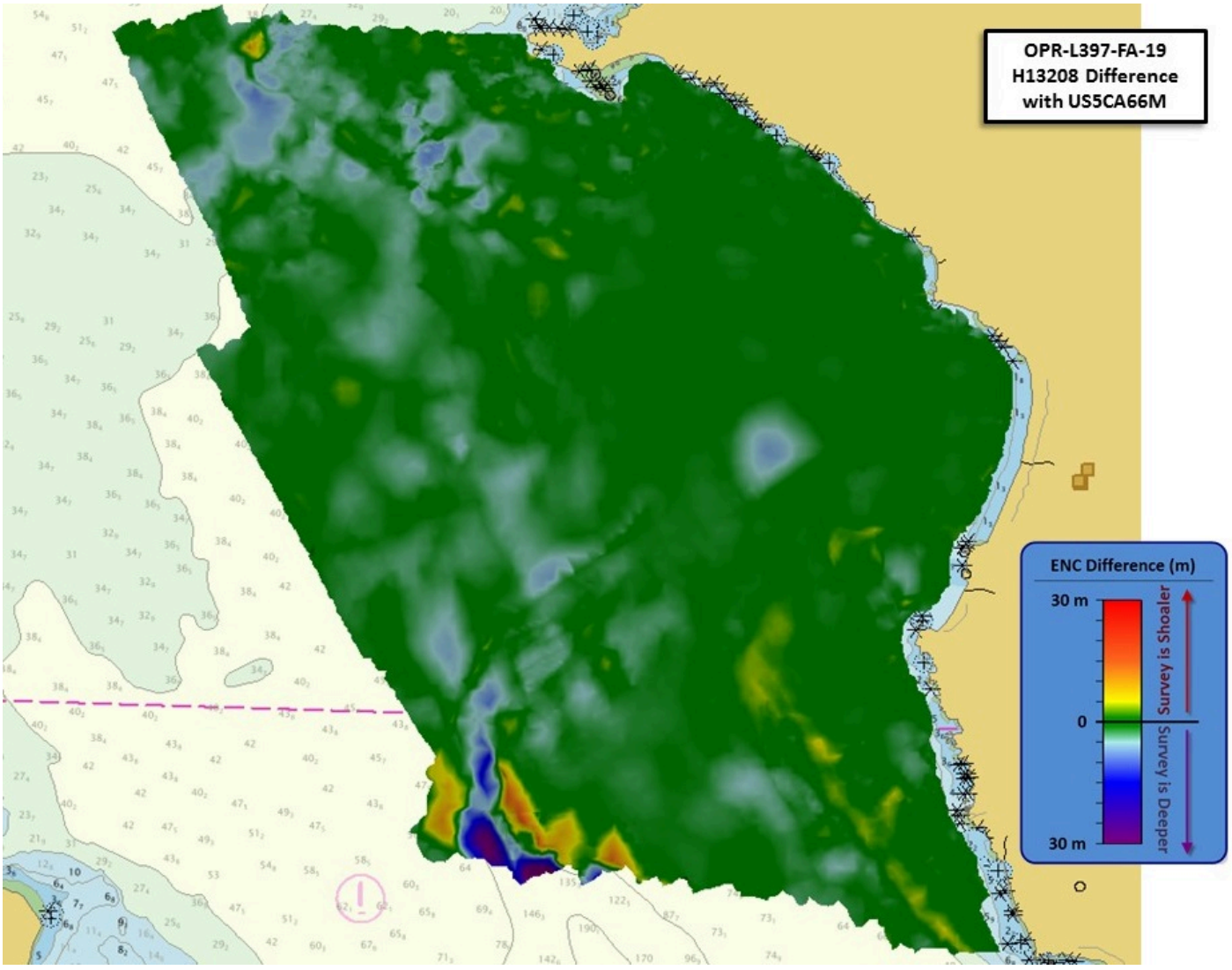
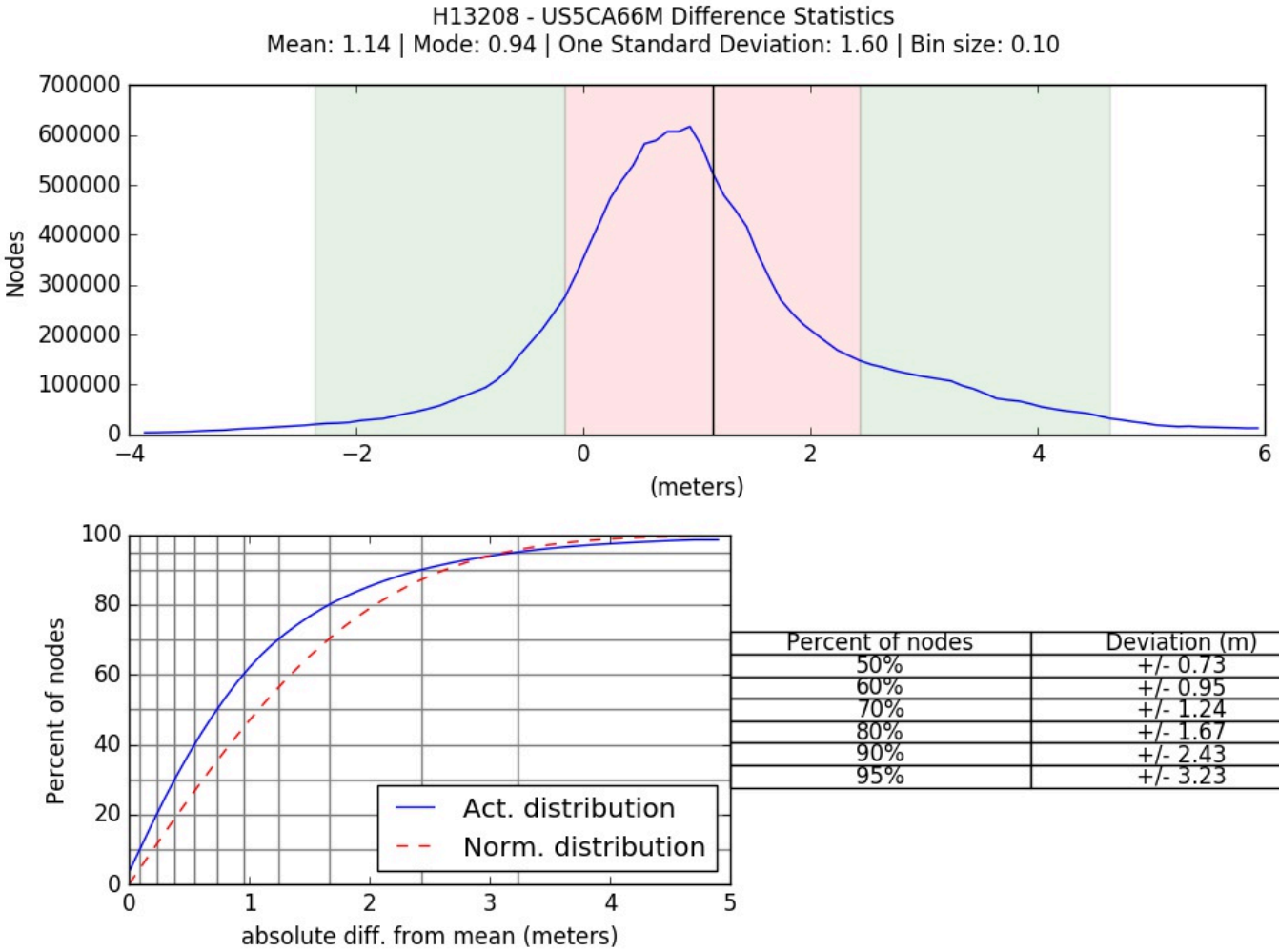


Figure 18: Difference surface between H13208 and interpolated TIN surface from ENC US5CA66M



Percent of nodes	Deviation (m)
50%	+/- 0.73
60%	+/- 0.95
70%	+/- 1.24
80%	+/- 1.67
90%	+/- 2.43
95%	+/- 3.23

Figure 19: Difference surface statistics between H13208 and interpolated TIN surface from ENC US5CA66M

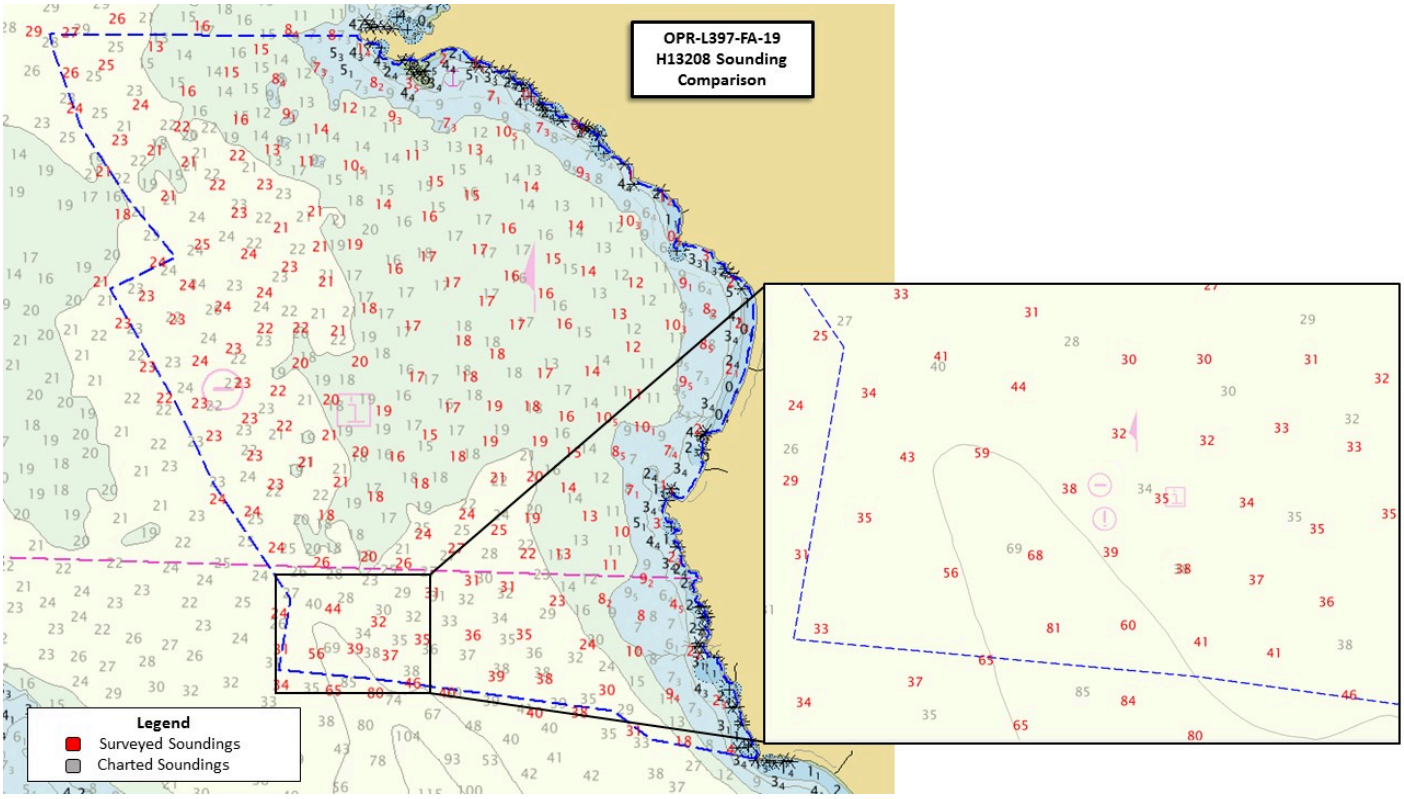


Figure 20: Overview of H13208 soundings (fathoms) overlaid onto ENC US5CA66M

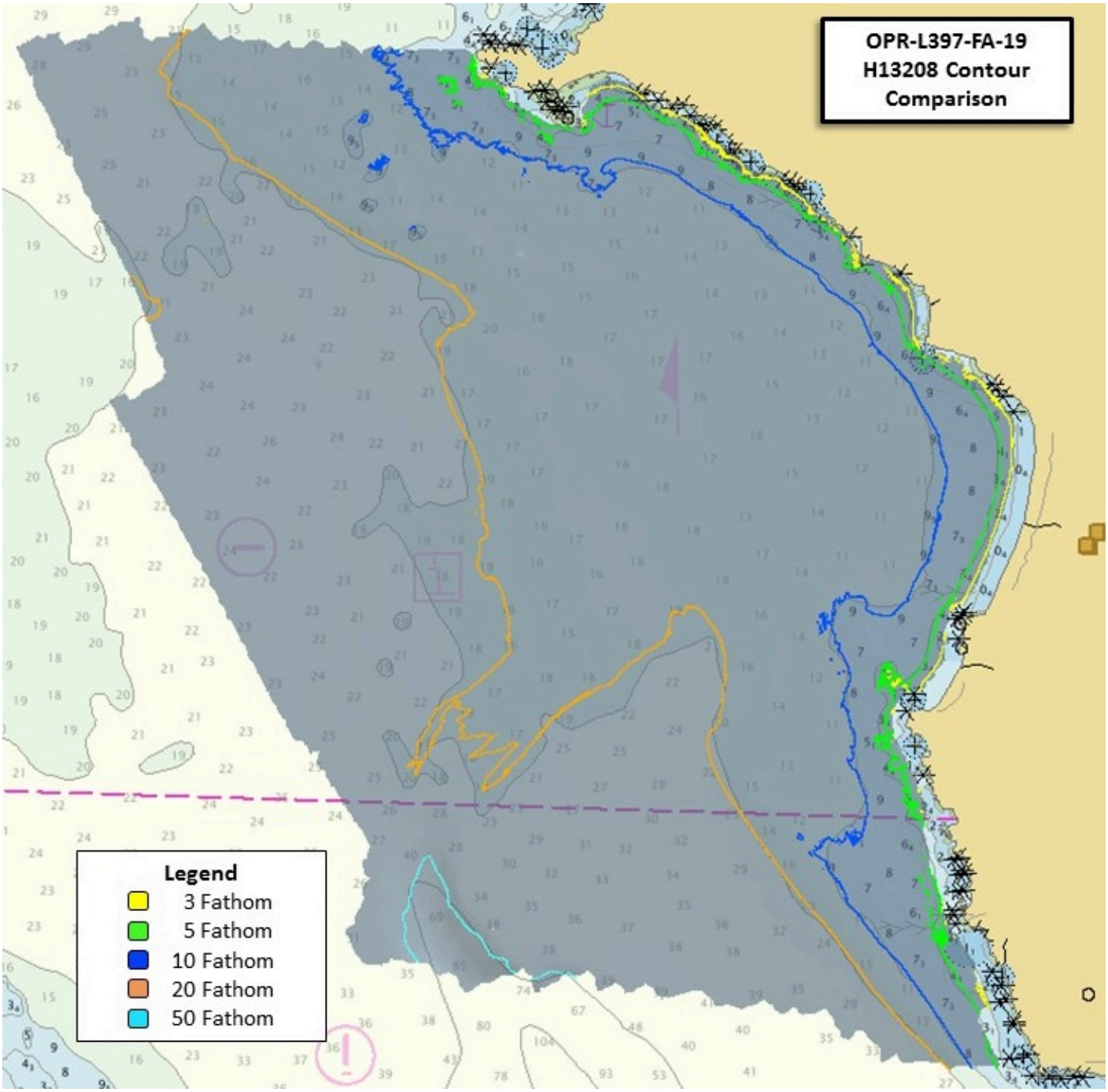


Figure 21: Overview of H13208 contours overlaid onto ENC US5CA66M

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

Survey H13208 has 12 new features that are addressed in the H13208 Final Feature File. Of these features, there is 1 new Obstruction, 3 new Land Areas, 3 Land Elevations, 4 new Seabed Areas, and 1 new Kelp feature.

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

Fairweather personnel conducted limited shoreline verification and reconnaissance, utilizing traditional shoreline methods, at times near predicted negative or low tides within the survey limits. Inaccessible features inshore of the NALL were attributed in the Final Feature File with the description of “Not Addressed” and remarks of “Retain as charted, not investigated due to being inshore of NALL” as per HSSD Section 7.3.1. Annotations, information, and diagrams collected on DP forms and boat sheets during field operations were scanned and included in the Separates I Detached Positions folder. Shoreline verification procedures for H13208 conform to those detailed in the DAPR.

D.2.2 Aids to Navigation

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

D.2.3 Overhead Features

No overhead features exist for this survey.

D.2.4 Submarine Features

No submarine features exist for this survey.

D.2.5 Platforms

No platforms exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Abnormal Seafloor and/or Environmental Conditions

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

D.2.8 Construction and Dredging

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

D.2.9 New Survey Recommendation

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

D.2.10 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 in the Descriptive Report.

Approver Name	Approver Title	Approval Date	Signature
CAPT. Marc Moser	Chief of Party	02/20/2020	MOSER.MARC.STANTON.1163193902 MOSER.MARC.STANTON.1163193902 2020.03.11 12:55:04 -07'00'
Lt. Steve Moulton	Operations Officer	02/20/2020	MOULTON.STEPHEN.F.1282116835 Digitally signed by MOULTON.STEPHEN.F.1282116835 Date: 2020.02.21 15:23:36 -08'00'
CHST Alissa Johnson	Chief Survey Technician	02/20/2020	JOHNSON.ALISSA.JEAN.1537531165 Digitally signed by JOHNSON.ALISSA.JEAN.1537531165 Date: 2020.02.20 15:04:59 -08'00'
HAST Kevin Lally	Sheet Manager	02/20/2020	LALLY.KEVIN.FRANCIS.1570734411 Digitally signed by LALLY.KEVIN.FRANCIS.1570734411 Date: 2020.03.11 13:30:14 -07'00'

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	Continuously 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
ERTDM	Ellipsoidally Referenced Tidal Datum Model
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

Acronym	Definition
HSSD	Hydrographic Survey Specifications and Deliverables
HSTB	Hydrographic Systems Technology Branch
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
MBAB	Multibeam Echosounder Acoustic Backscatter
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NALL	Navigable Area Limit Line
NTM	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
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
RTX	Real Time Extended
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
SSSAB	Side Scan Sonar Acoustic Backscatter
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
ZDF	Zone Definition File

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

July 30, 2019

MEMORANDUM FOR: Captain Richard T. Brennan, NOAA
Chief, Hydrographic Surveys Division

FROM: Meredith Payne
Project Manager OPR-L397-FA-19, Hydrographic Surveys Division

SUBJECT: Early Data Release OPR-L397-FA-19

Hydrographic Surveys Division (HSD) requests a waiver for NOAA Ship *Fairweather* to release ship-processed data for the project OPR-L397-FA-19, Channel Islands to the Channel Islands National Marine Sanctuary (CINMS) stakeholders prior to passing RSA or SAR procedures at the processing branch.

Justification

OPR-L397-FA-19, Channel Islands was a project jointly funded by HSD and CINMS for the purpose of nautical chart updates and sanctuary management/habitat mapping. During planning stages for the project early data release to stakeholders was agreed to by HSD.

CINMS agrees to append the following Department of Commerce counsel-approved language to any products produced with these preliminary data:

> *These data are preliminary, and as such may contain position and depth errors and/or other quality issues. Products generated with these data are not to be used for measurements or navigation under any circumstances.*
>
> *The user assumes the entire risk related to the use of these data or products generated with these data. The Office of Coast Survey is providing these data "as-is," and OCS disclaims any and all warranties, whether express or implied, including any implied warranties of merchantability or fitness for a particular purpose. In no event will OCS be liable to you or to any third party for any direct, indirect, incidental, consequential, special, or exemplary damages or lost profit resulting from any use or misuse of these data.*

Decision

Waiver is: ☐ Granted

☐ Denied

APPROVAL PAGE

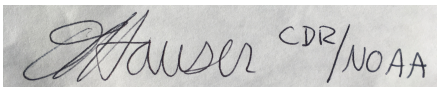
H13208

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.



Digitally signed by HAUSER.OLIVIA.A.1275636009
Date: 2020.10.19 17:14:12 -07'00'

Approved:_____

Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch