H13085

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area Support NMS
Registry Number:	H13085

LOCALITY

State(s):	California
General Locality:	California
Sub-locality:	East San Miguel Passage and Vicinity

2018

CHIEF OF PARTY
Benjamin K. Evans, CDR/NOAA

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Date:

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

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H13085

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:	**California**
Sub-Locality:	**East San Miguel Passage and Vicinity**
Scale:	**20000**
Dates of Survey:	**09/26/2018 to 10/21/2018**
Instructions Dated:	**08/17/2018**
Project Number:	**OPR-L397-RA-18**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**Benjamin K. Evans, CDR/NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backcatter**
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 H13085

Project: OPR-L397-RA-18

Locality: California

Sublocality: East San Miguel Passage and Vicinity

Scale: 1:20000

September 2018 - October 2018

NOAA Ship *Rainier*

Chief of Party: Benjamin K. Evans, CDR/NOAA

A. Area Surveyed

This survey is referred to as H13085, "East San Miguel Passage and Vicinity" (sheet 1). The assigned survey area encompasses approximately 23 square nautical miles immediately west of Santa Rosa Island within the Channel Islands National Marine Sanctuary (CINMS), California.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
34° 3' 58.32" N 120° 17' 34.08" W	33° 53' 57.84" N 120° 10' 57.72" W

Table 1: Survey Limits

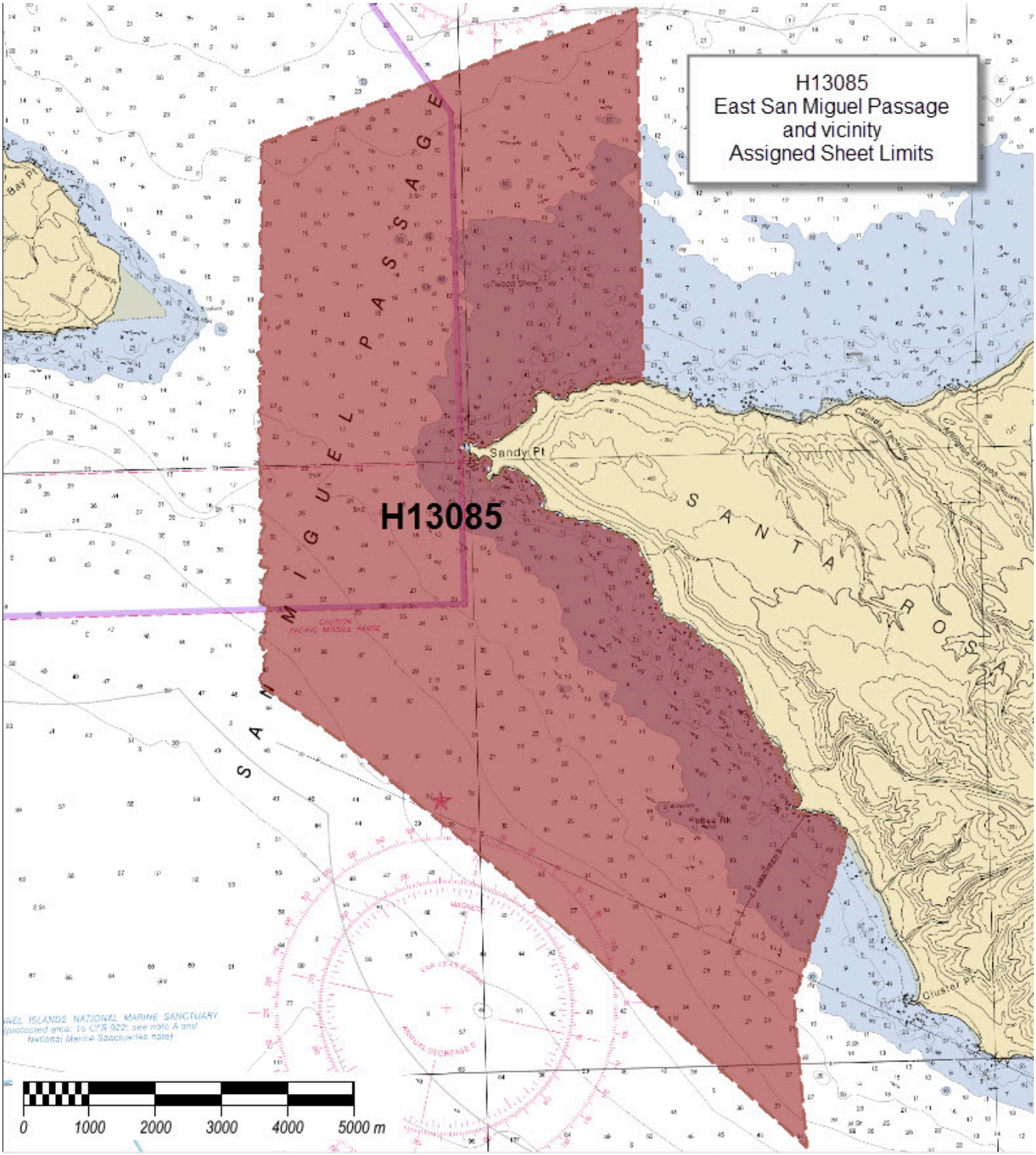


Figure 1: H13085 assigned survey area (Chart 18727).

Data were acquired within the assigned survey limits as required in the Project Instructions and HSSD unless otherwise noted in this report.

A.2 Survey Purpose

Santa Rosa Island is the second largest and second most western of the Channel Islands, located about 26 miles from the California mainland city of Santa Barbara. The island is relatively remote, windswept, and home to abundant pinniped and seabird populations, as well as to rare species of flora. 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 adding to 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 also generated 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.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Pydro QC Tools 2 Grid QA was used to analyze H13085 multibeam echosounder (MBES) data density. The submitted H13085 finalized variable-resolution (VR) surface met HSSD density and full coverage requirements as shown in the histograms below.

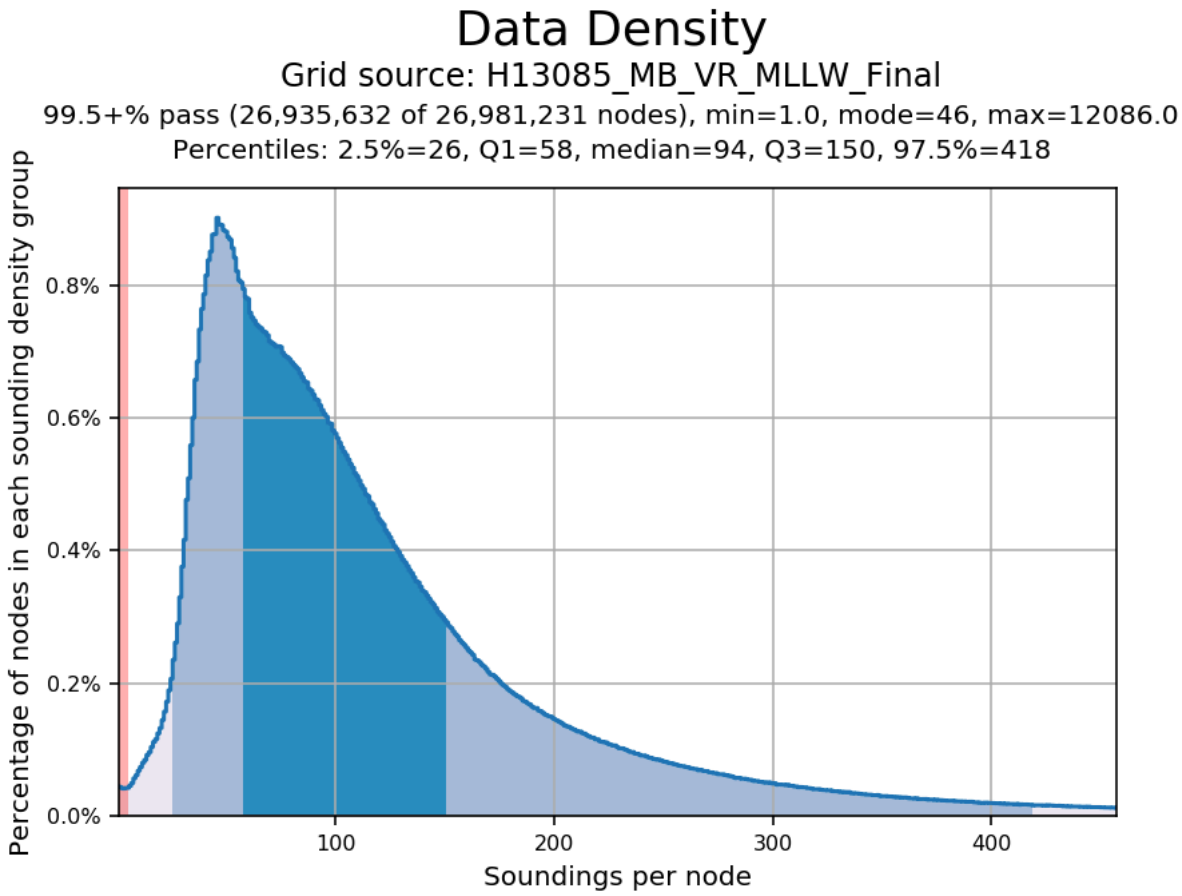


Figure 2: Pydro derived plot showing HSSD density compliance of H13085 finalized variable-resolution MBES data.

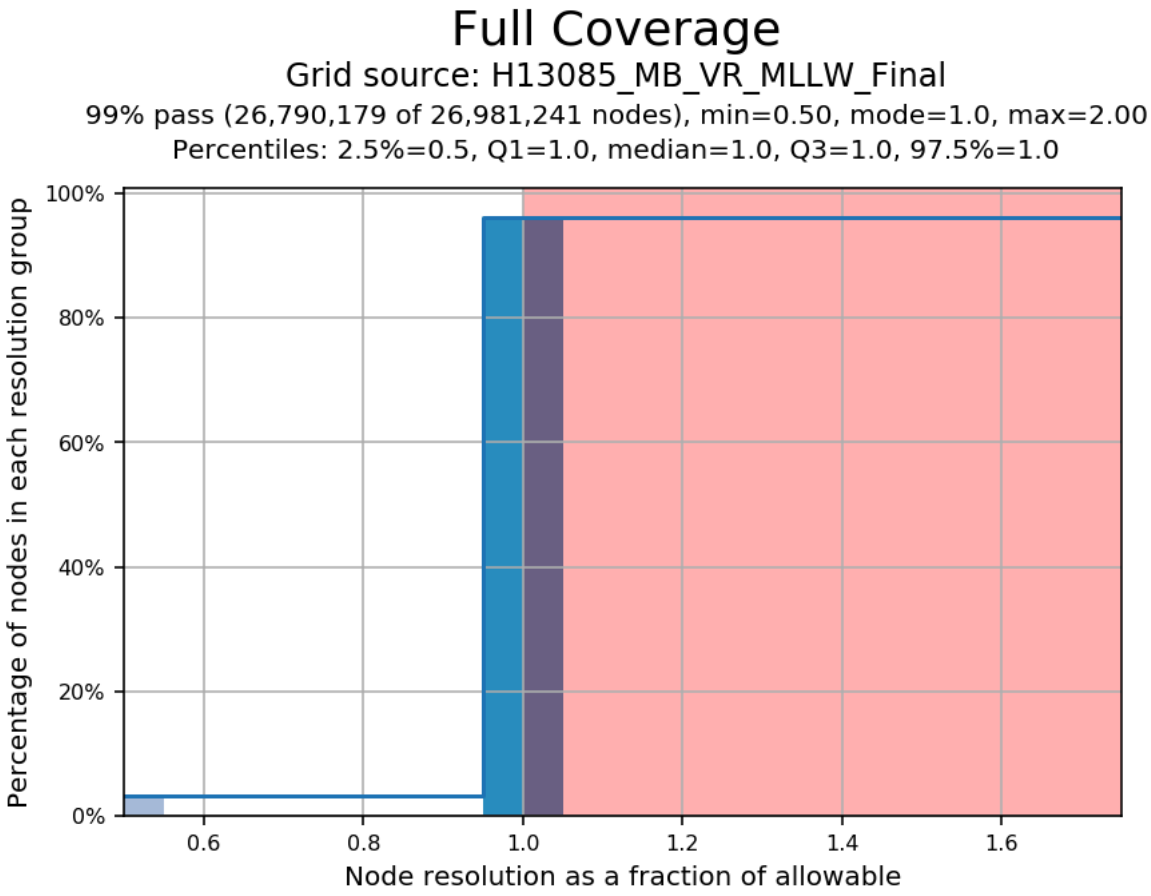


Figure 3: Pydro derived plot showing HSSD full coverage compliance of H13085 finalized variable-resolution MBES data.

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 (Refer to HSSD Section 5.2.2.3)
All waters in survey area	Acquire backscatter data during all multibeam data acquisition (Refer to HSSD Section 6.2)

Table 2: Survey Coverage

Complete multibeam echosounder coverage was acquired to the inshore limit of hydrography, the Navigable Area Limit Line (NALL). The NALL is defined as the most seaward of the following: the surveyed 3.5-meter depth contour, the line defined by the distance seaward from the observed MHW line which is equivalent to 0.8 millimeters at chart scale (the assigned sheet limits closely reflect this) or the inshore limit

of safe navigation (Figure 4). Areas where H13085 survey coverage reached neither 3.5 meters water depth, nor the assigned sheet limits, were due to the presence of dangerous wave action and / or thick kelp. One gap in coverage ("holiday") measuring approximately 5x30 meters was caused by the presence of dangerous breaking waves over an offshore shoal area (Figure 5). A second coverage gap within the assigned survey area measures approximately 4 x 4 meters and was apparently due to inadequate survey line spacing.

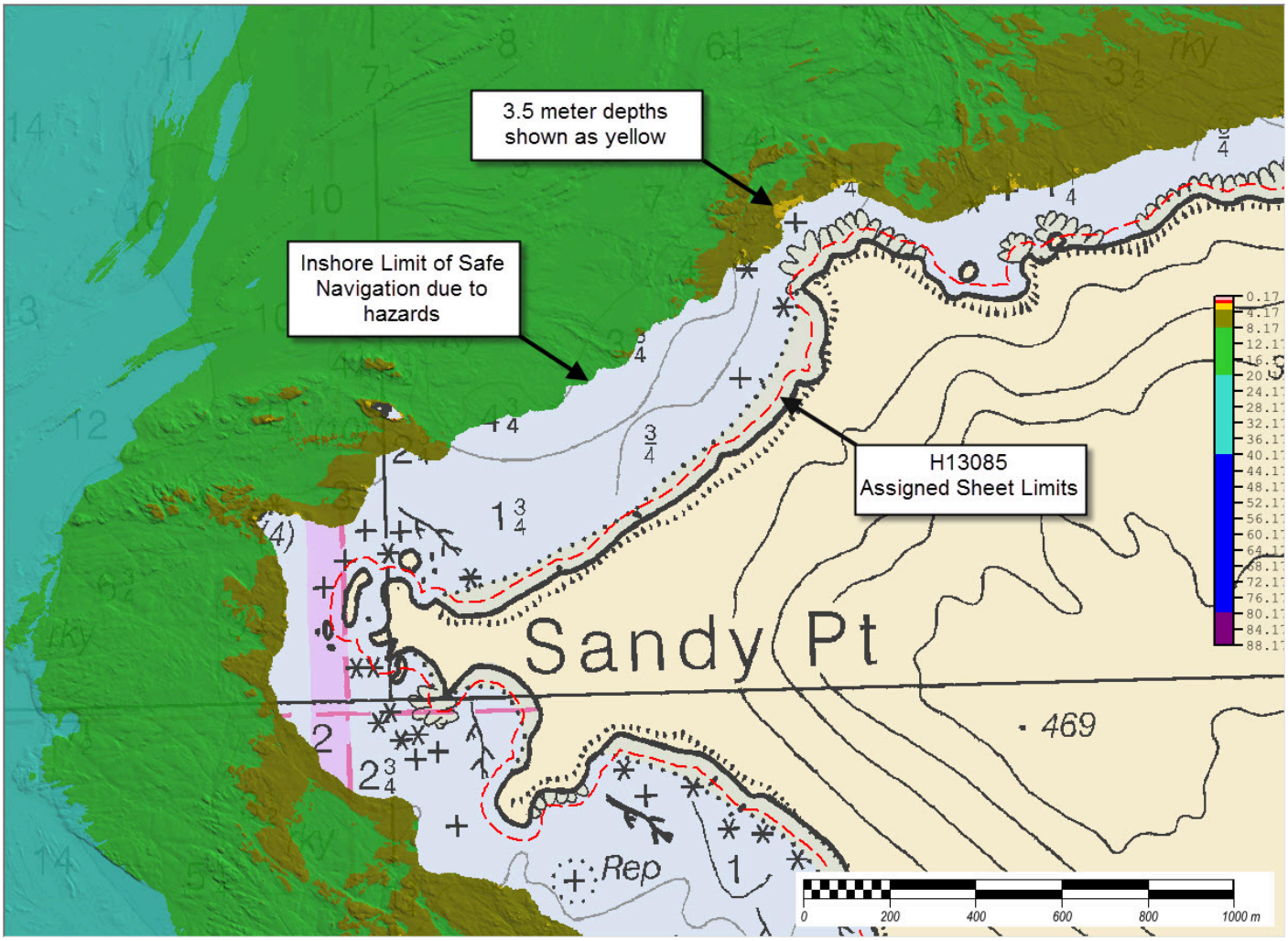


Figure 4: Examples of H13085 NALL determination.

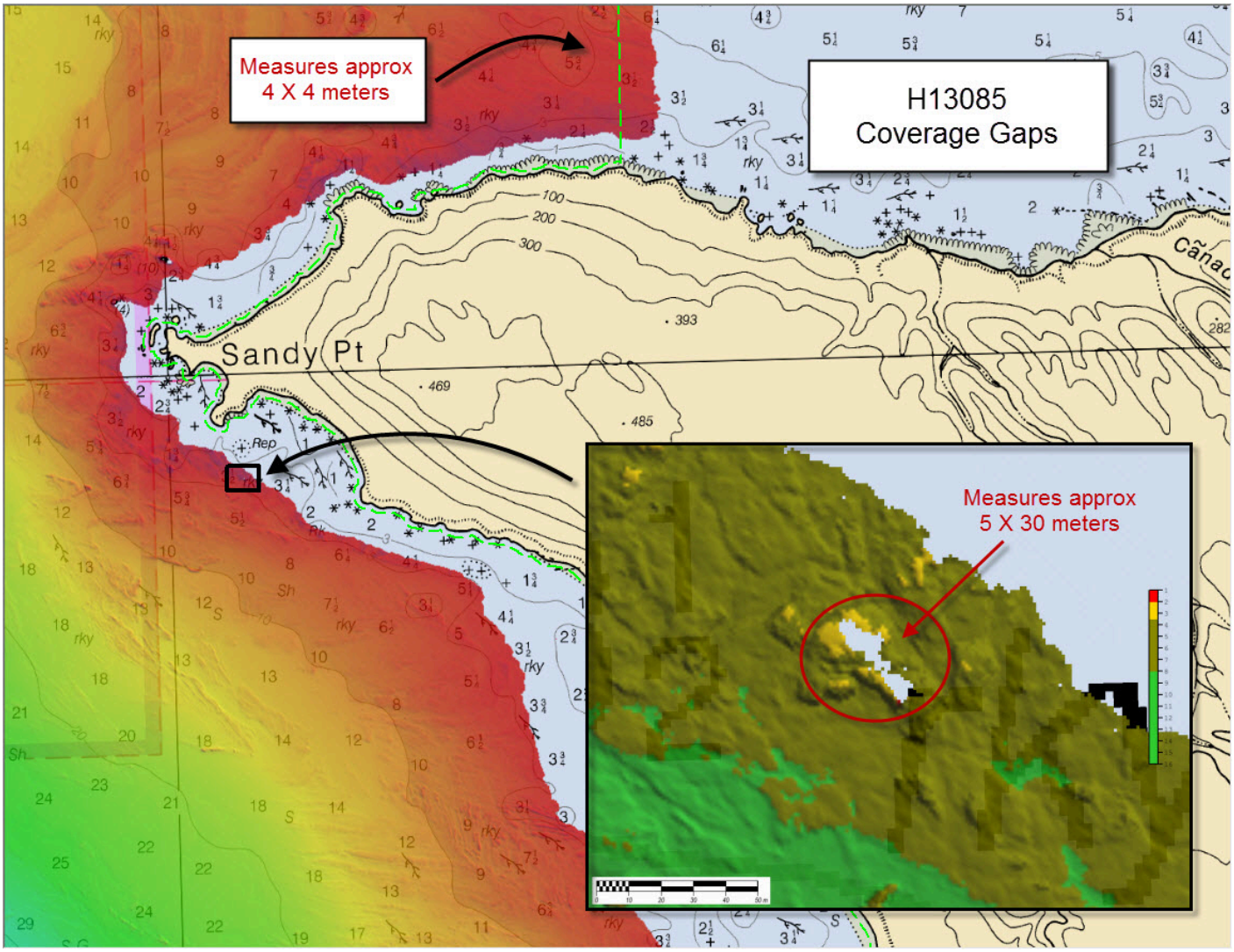


Figure 5: H13085 coverage gaps.

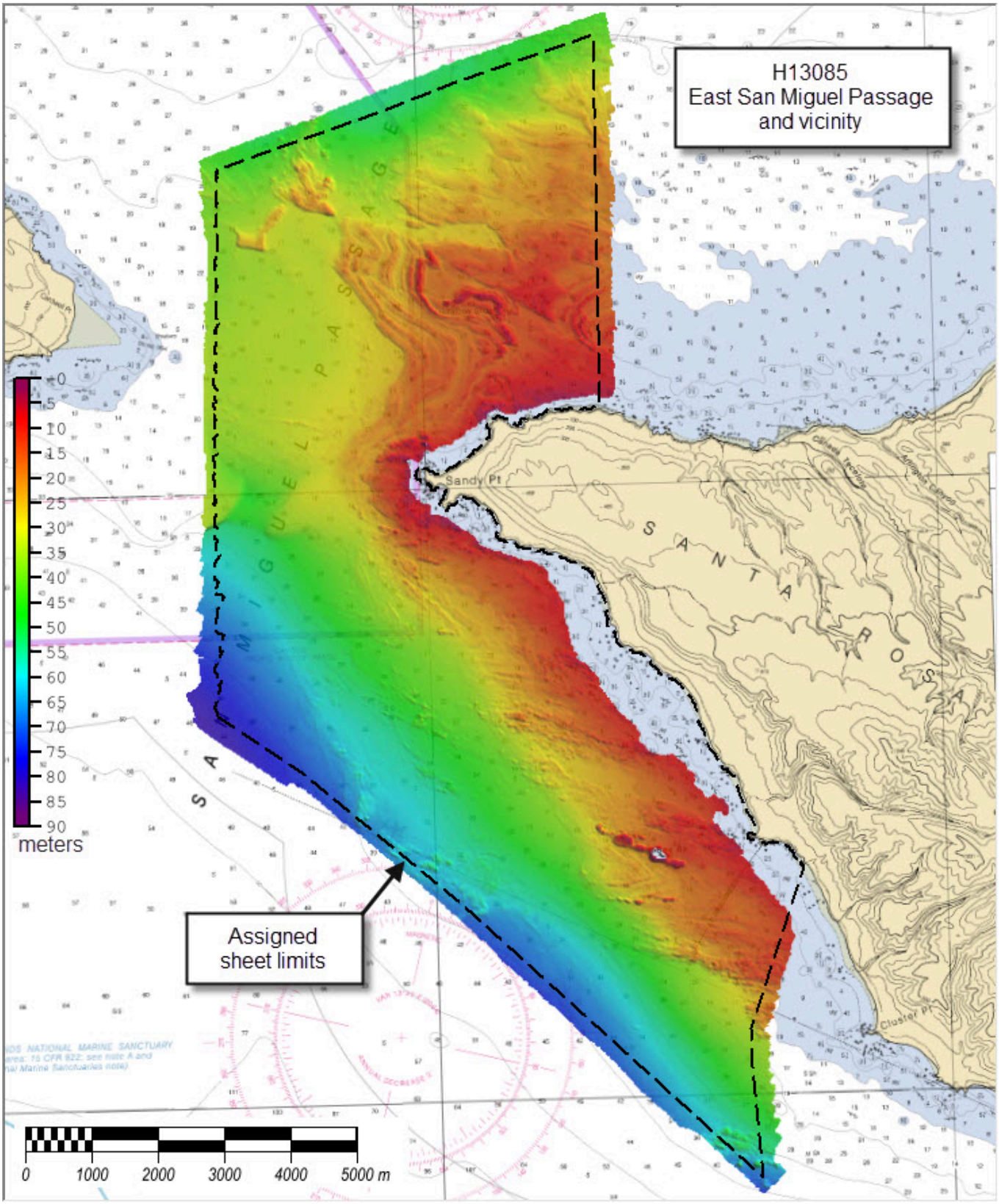


Figure 6: H13085 survey coverage.

A.6 Survey Statistics

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

	HULL ID	*2801*	*2802*	*2803*	*2804*	*Total*
LNM	**SBES Mainscheme**	0	0	0	0	0
	MBES Mainscheme	149.74	130.66	126.18	141.29	547.87
	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	8.52	0	9.91	3.94	22.37
	Lidar Crosslines	0	0	0	0	0
Number of Bottom Samples						0
Number Maritime Boundary Points Investigated						0
Number of DPs						18
Number of Items Investigated by Dive Ops						0
Total SNM						23.37

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/26/2018	269
09/29/2018	272
09/30/2018	273
10/01/2018	274
10/10/2018	283
10/11/2018	284
10/18/2018	291
10/21/2018	294

Table 4: 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	*2801*	*2802*	*2803*	*2804*	*2701*
LOA	8.8 meters	8.8 meters	8.8 meters	8.8 meters	7.6 meters
Draft	1.1 meters	1.1 meters	1.1 meters	1.1 meters	0.47 meters

Table 5: Vessels Used

Figure 7: RAINIER Launches 2801 and 2803 near Santa Barbara Island, CA.

All MBES data for H13085 were acquired by NOAA Ship RAINIER survey launches 2801, 2802, 2803 and 2804. These vessels acquired depth soundings, backscatter imagery and sound speed profiles. Shoreline feature verification was conducted from RAINIER launch 2701.

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POS MV 320 v5	Positioning and Attitude System
Kongsberg Maritime	EM 2040	MBES
Sea-Bird Scientific	SBE 19plus	Conductivity, Temperature, and Depth Sensor
Reson	SVP 70	Sound Speed System

Table 6: Major Systems Used

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

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 4.08% of mainscheme acquisition.

RAINIER launches 2801, 2803 and 2804 acquired 22.4 nautical miles of multibeam crosslines across all depth ranges, water masses and boat days that were safe and operationally practical. The Hydrographer deems them adequate for verifying and evaluating the internal consistency of H13085 mainscheme survey data. Crossline analysis was performed using the Compare Grids function in Pydro Explorer on variable-resolution surfaces of H13085 mainscheme only and crossline only data. 99.5+% of nodes met allowable uncertainties; see Pydro generated histograms below.

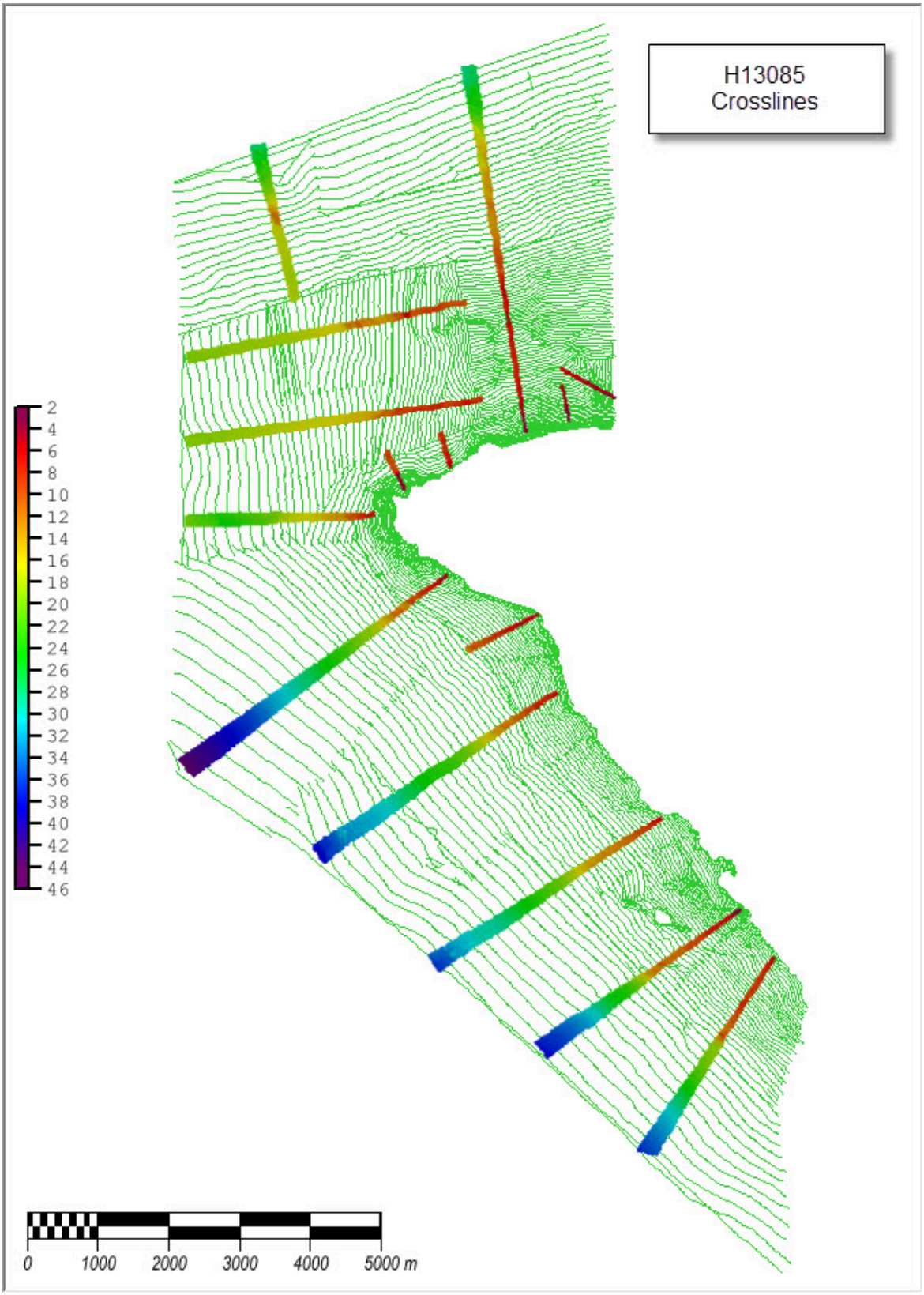


Figure 8: H13085 crossline surface overlaid on mainscheme tracklines.

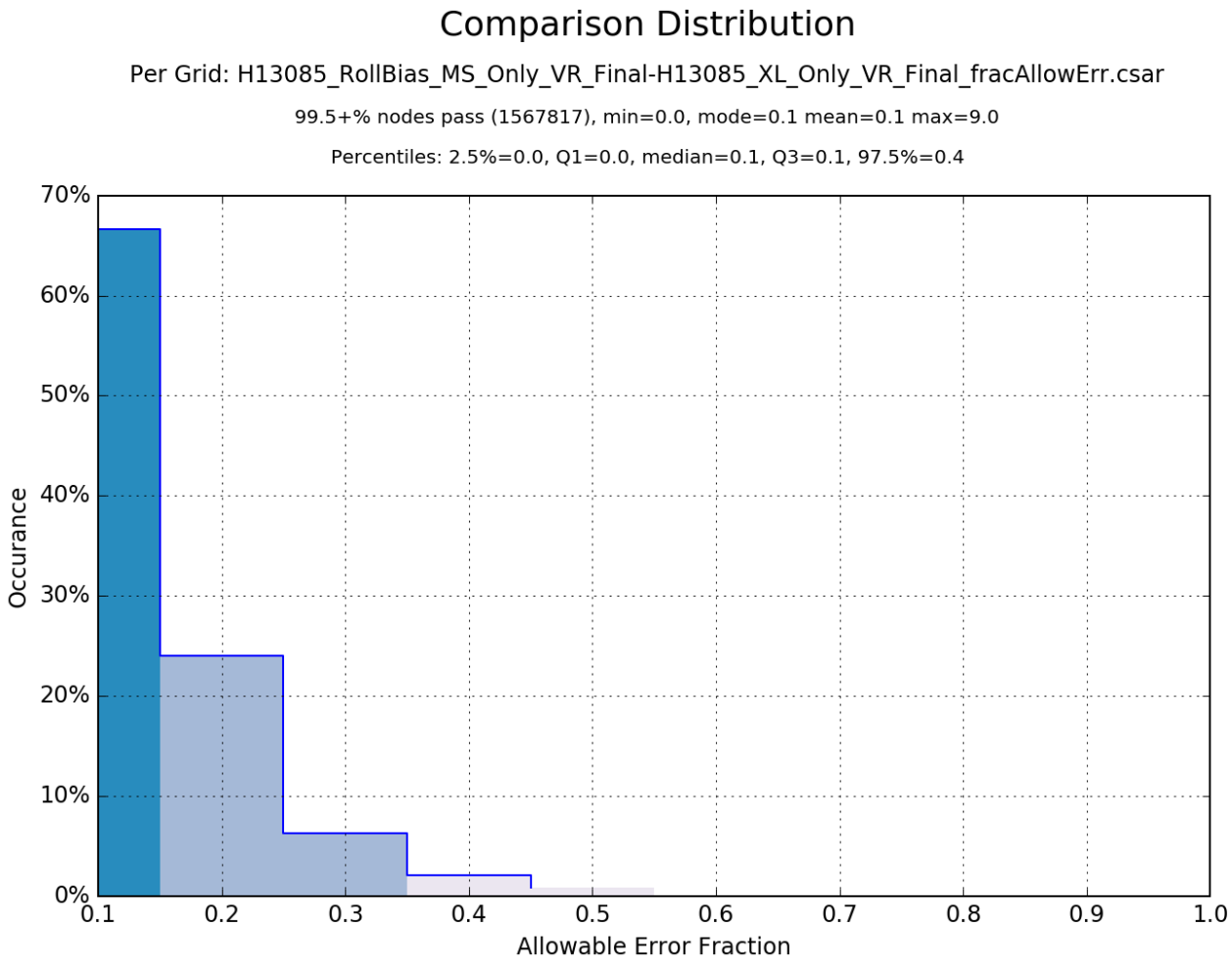
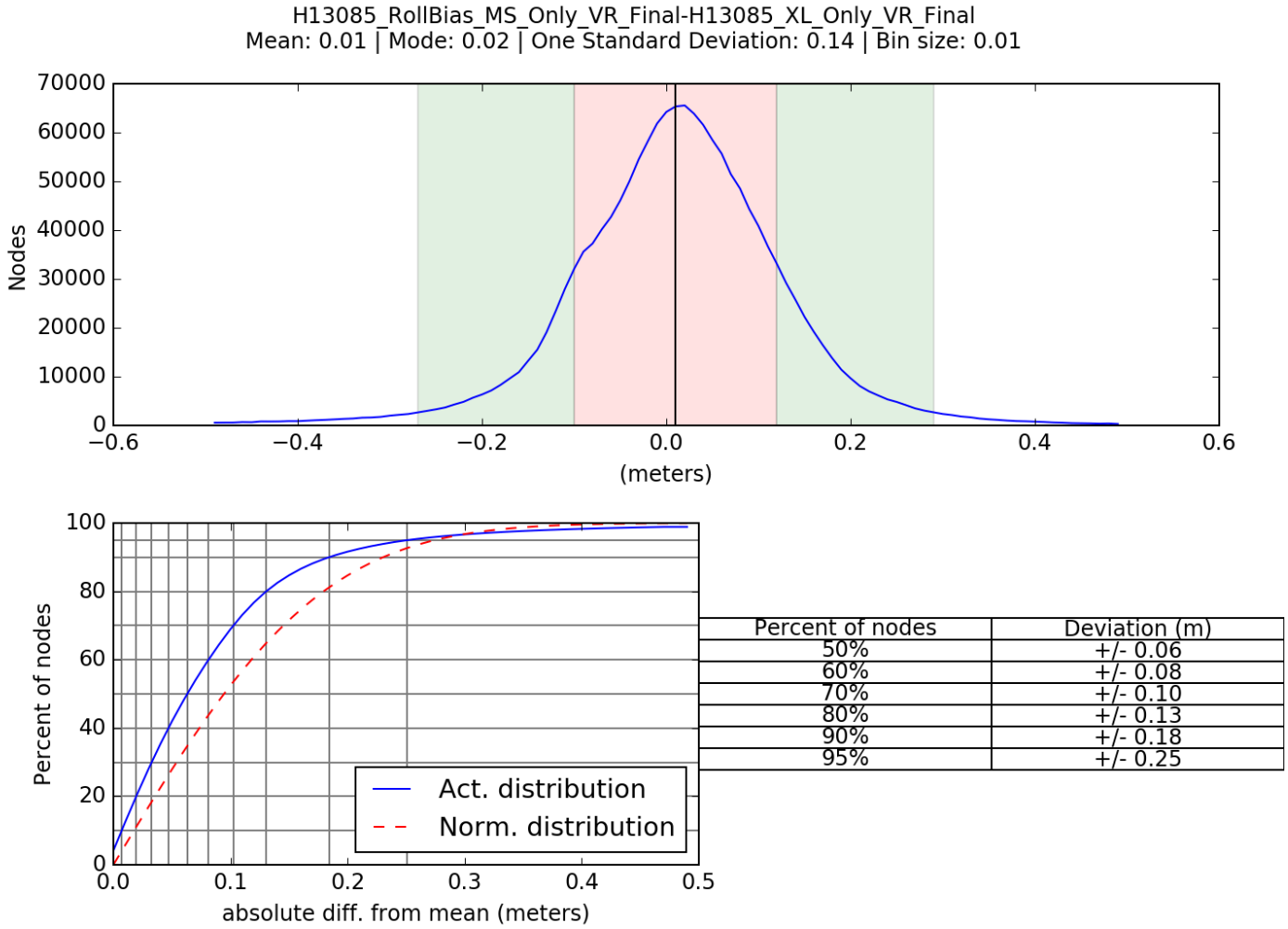


Figure 9: Pydro derived plot showing node percentage-pass value of H13085 mainscheme to crossline data.



Percent of nodes	Deviation (m)
50%	+/- 0.06
60%	+/- 0.08
70%	+/- 0.10
80%	+/- 0.13
90%	+/- 0.18
95%	+/- 0.25

Figure 10: Pydro derived plot showing absolute difference statistics of H13085 mainscheme to crossline data.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0 meters	0.083 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
2801,2802,2803,2804	3 meters/second	n/a meters/second	0.05 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Total Propagated Uncertainty (TPU) values for survey H13085 were derived from a combination of fixed values for equipment and vessel characteristics, as well as from field assigned values for sound speed uncertainties. The uncertainty value of NOAA's Vertical Datum (VDatum) transformation model was documented in metadata that accompanied the VDatum model.

In addition to the usual a priori estimates of uncertainty, some real-time and post-processed uncertainty sources were also incorporated into the depth estimates of this survey. Real-time uncertainties from Kongsberg MBES sonars were recorded and applied in post-processing. Applanix TrueHeave (POS) files, which record estimates of heave uncertainty, were also applied during post-processing. Finally, the postprocessed uncertainties associated with vessel position and attitude were applied in Caris HIPS using SBET and RMS files generated using POSPac MMS software.

Uncertainty values of the submitted finalized grid was calculated in Caris using "Greater of the Two" of uncertainty and standard deviation (scaled to 95%). Grid QA within Pydro QC Tools 2 was used to analyze H13085 Total Vertical Uncertainty (TVU) compliance, a histogram plot of the results is shown below.

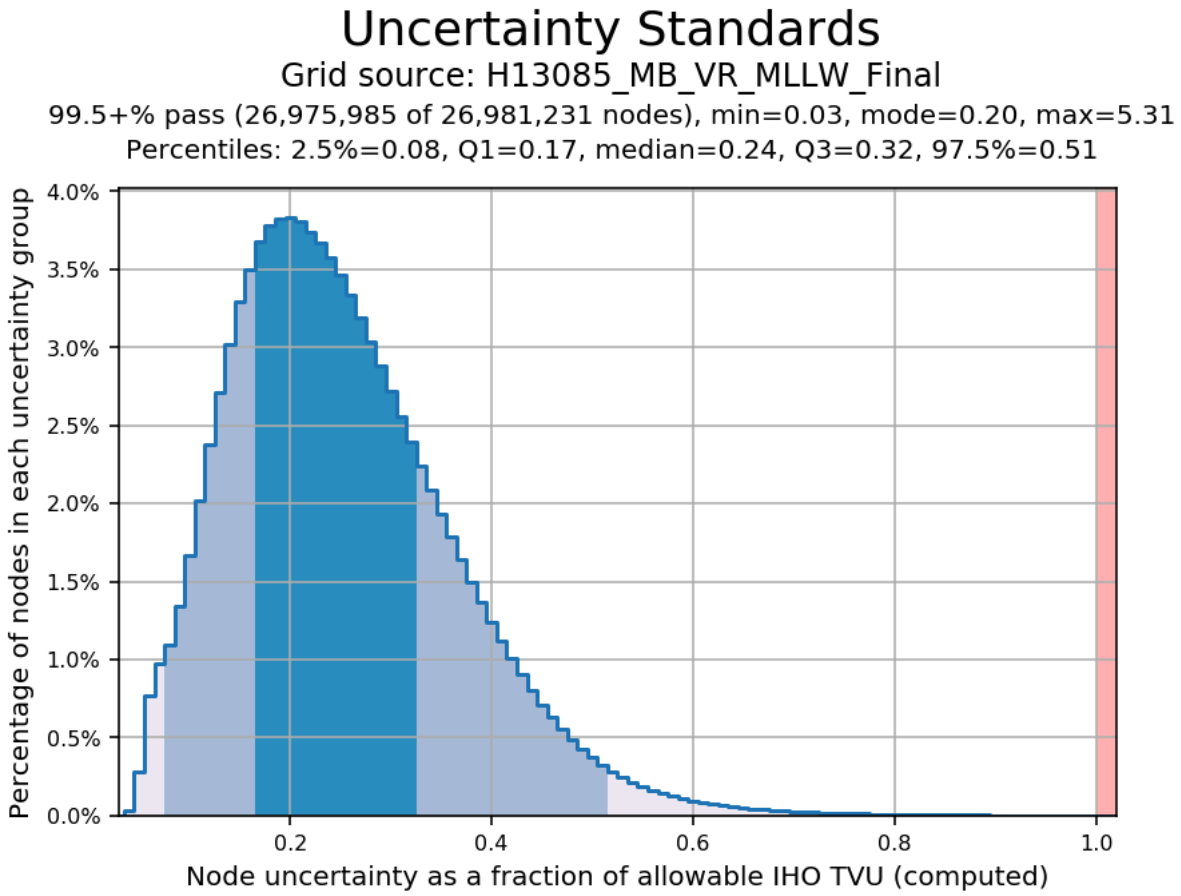


Figure 11: Pydro derived plot showing TVU compliance of H13085 finalized multi-resolution MBES data.

B.2.3 Junctions

H13085 junctions with three surveys, two were conducted by NOAA Ship RAINIER in 2017, the third is contemporary and part of the same project, OPR-L397-RA-18. Comparisons were made using the Compare Grids program within Pydro Explorer.

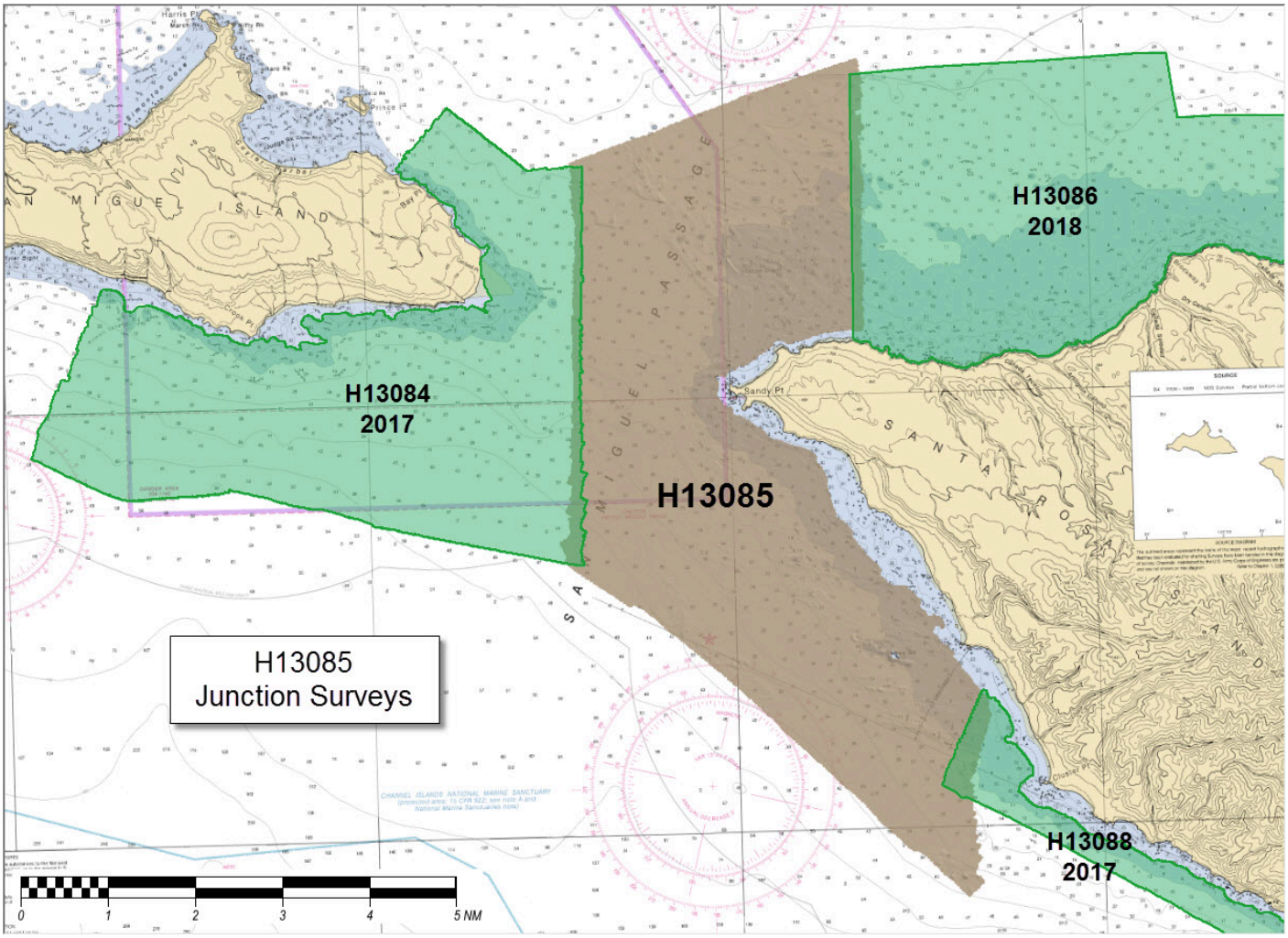


Figure 12: H13085 junction surveys (Chart 18727).

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13084	1:20000	2017	NOAA Ship RAINIER	W
H13088	1:20000	2017	NOAA Ship RAINIER	SE
H13086	1:20000	2018	NOAA Ship RAINIER	E

Table 9: Junctioning Surveys

H13084

The junction with 2017 survey H13084 encompassed approximately 0.55 square nautical miles along the western boundary of H13085 (Figure 13). Pydro's Compare Grids results showed that 99.5+% of nodes in the common area met NOAA allowable error standards (Figure 14).

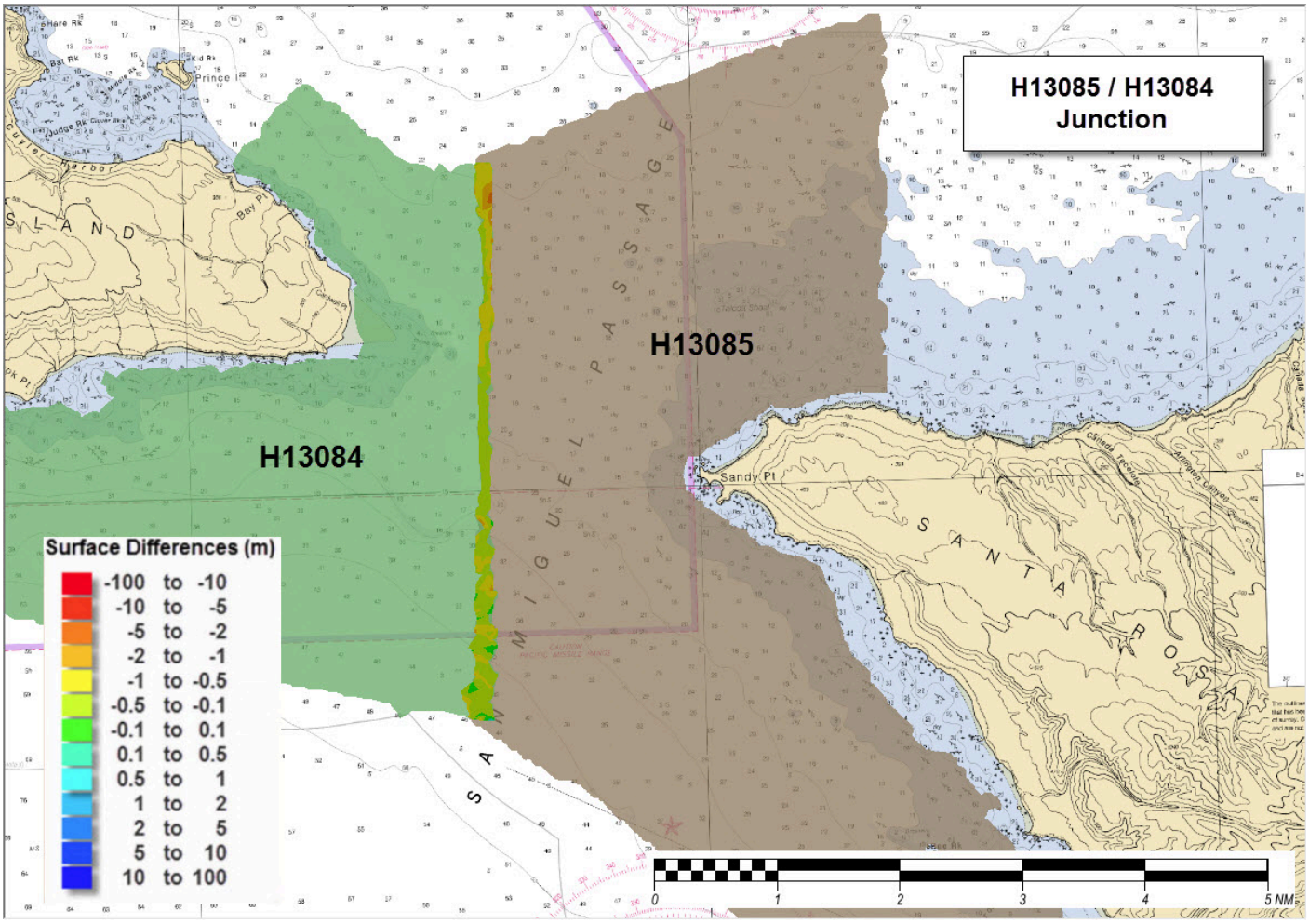


Figure 13: H13085 / H13084 junction.

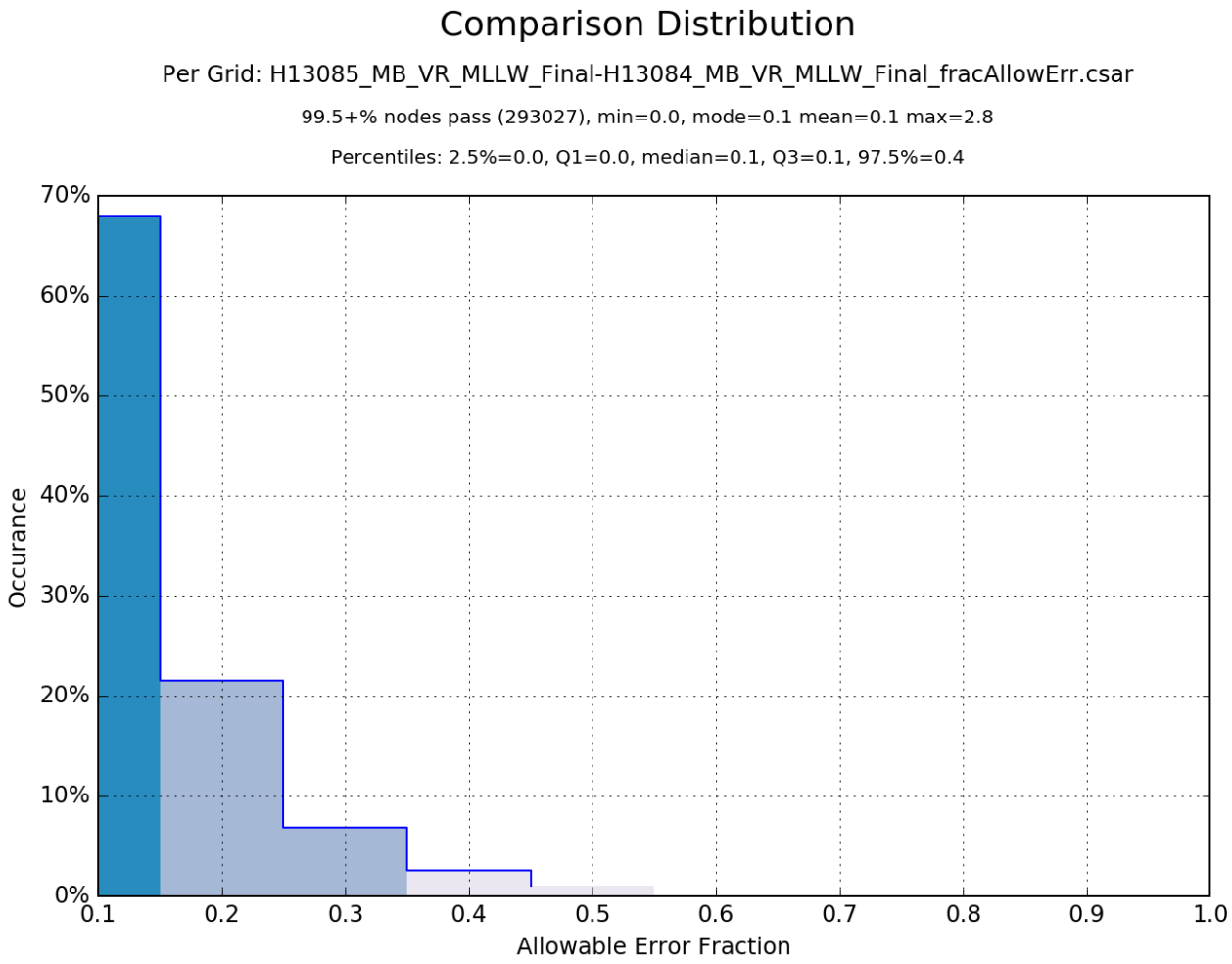


Figure 14: Pydro derived plot showing H13085 / H13084 VR surface comparison statistics.

H13088

The junction with 2017 survey H13088 encompassed approximately 0.29 square nautical miles along the southeastern boundary of H13085 (Figure 15). Pydro's Compare Grids results showed that 99.0% of nodes in the common area met NOAA allowable error standards (Figure 16).

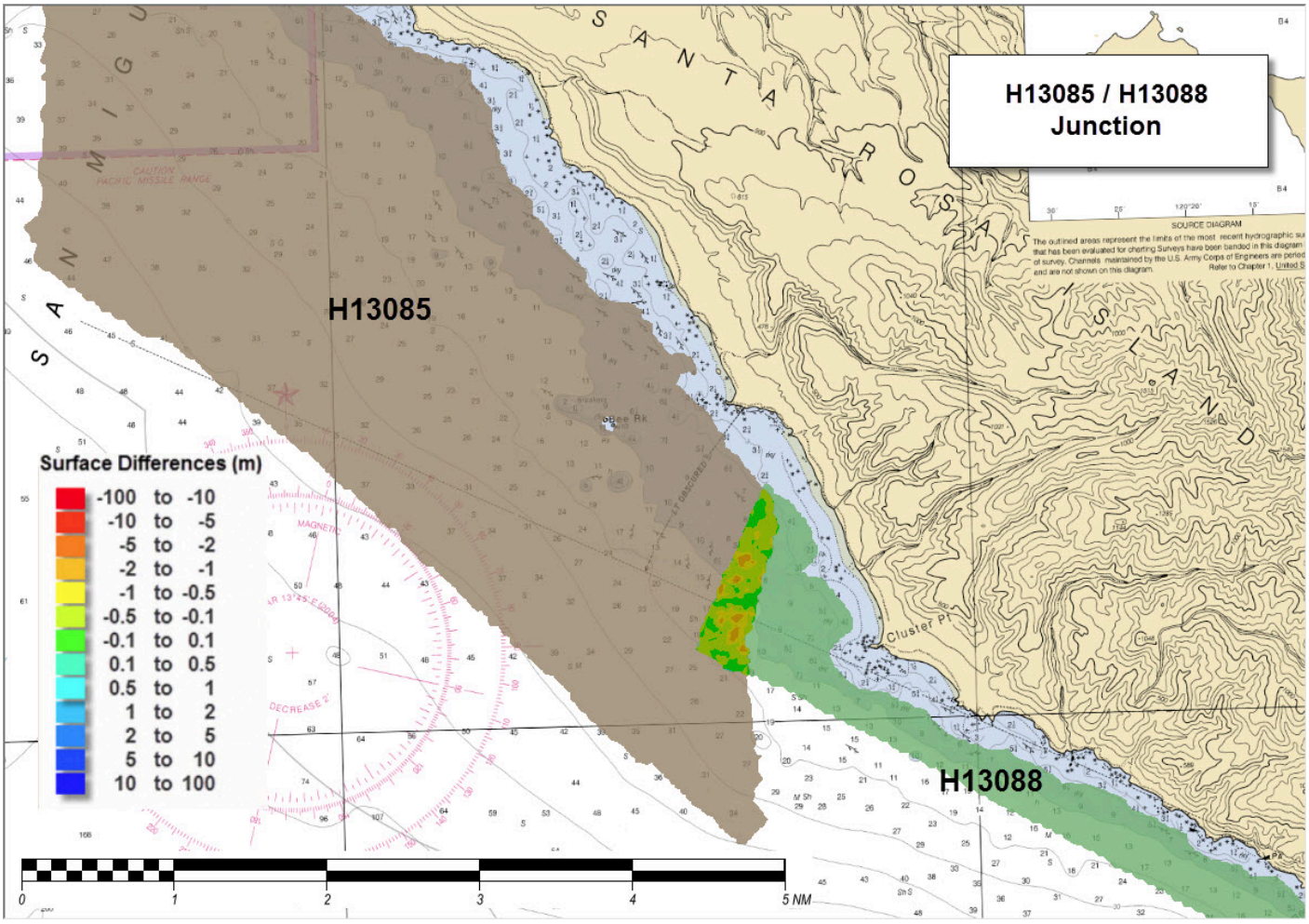


Figure 15: H13085 / H13088 junction.

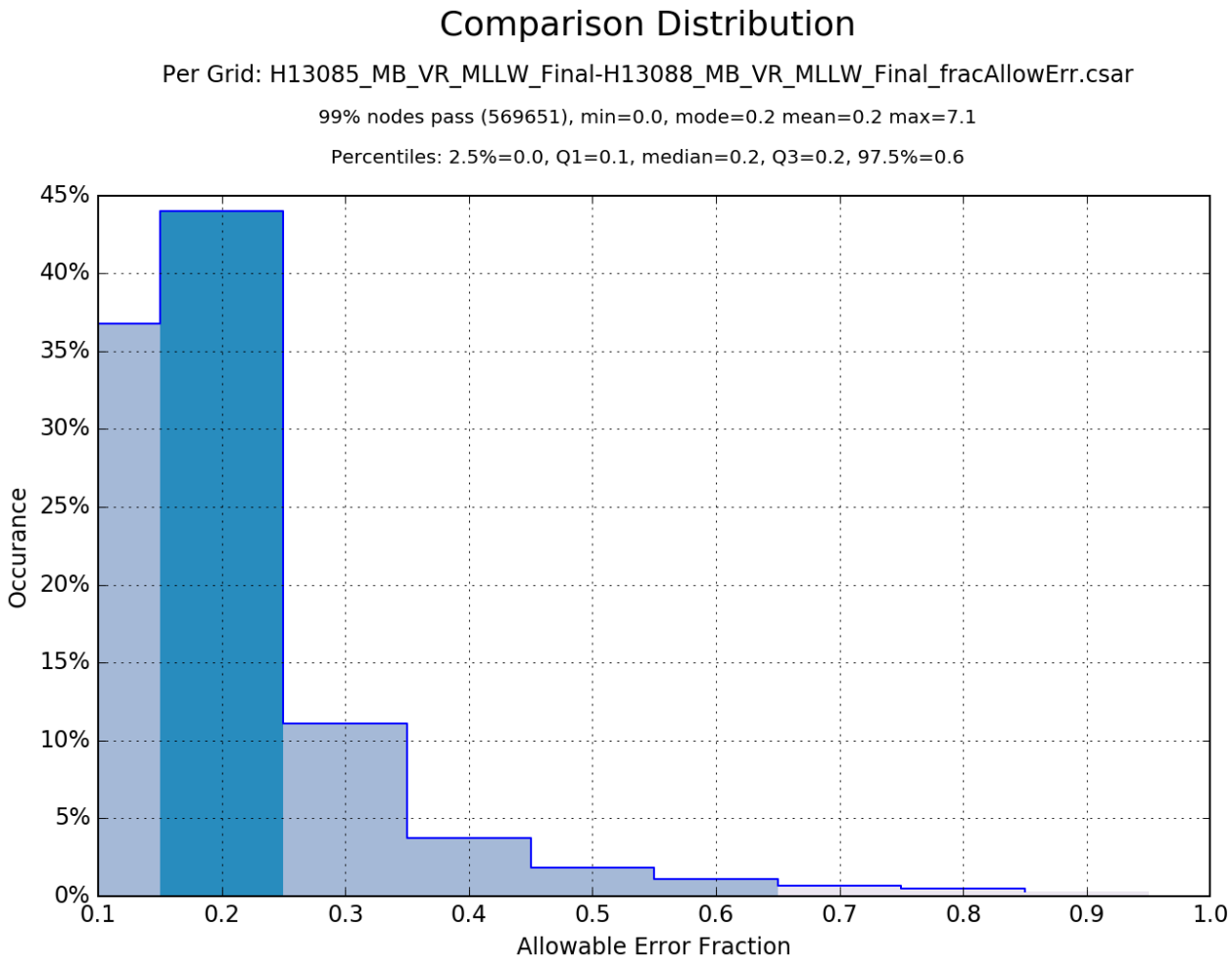


Figure 16: Pydro derived plot showing H13085 / H13088 VR surface comparison statistics.

H13086

The junction with 2018 survey H13086 encompassed approximately 0.56 square nautical miles along the eastern boundary of H13085 (Figure 17). Pydro's Compare Grids results showed that 99.5+% of nodes in the common area met NOAA allowable error standards (Figure 18).

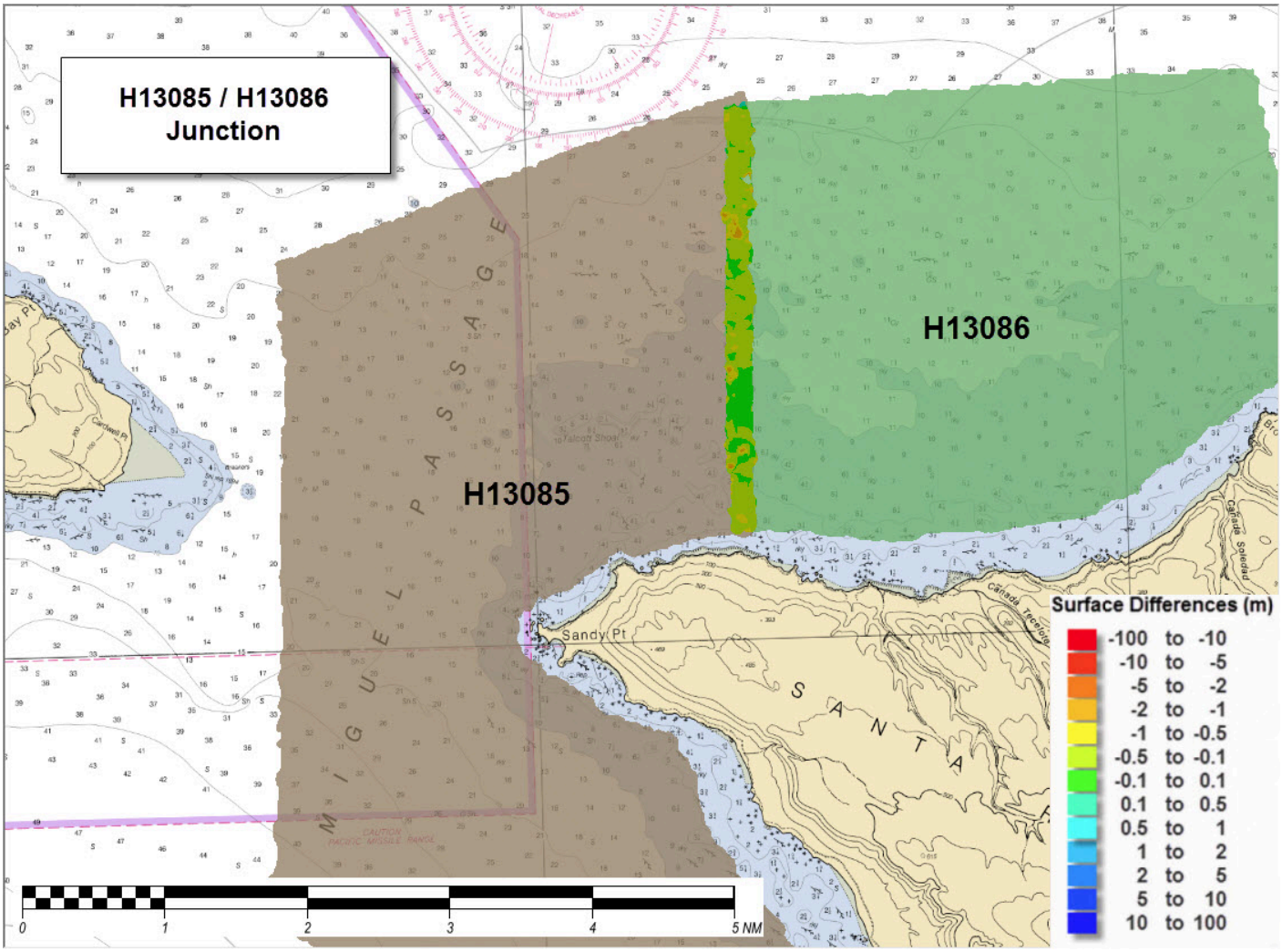


Figure 17: H13085 / H13086 junction.

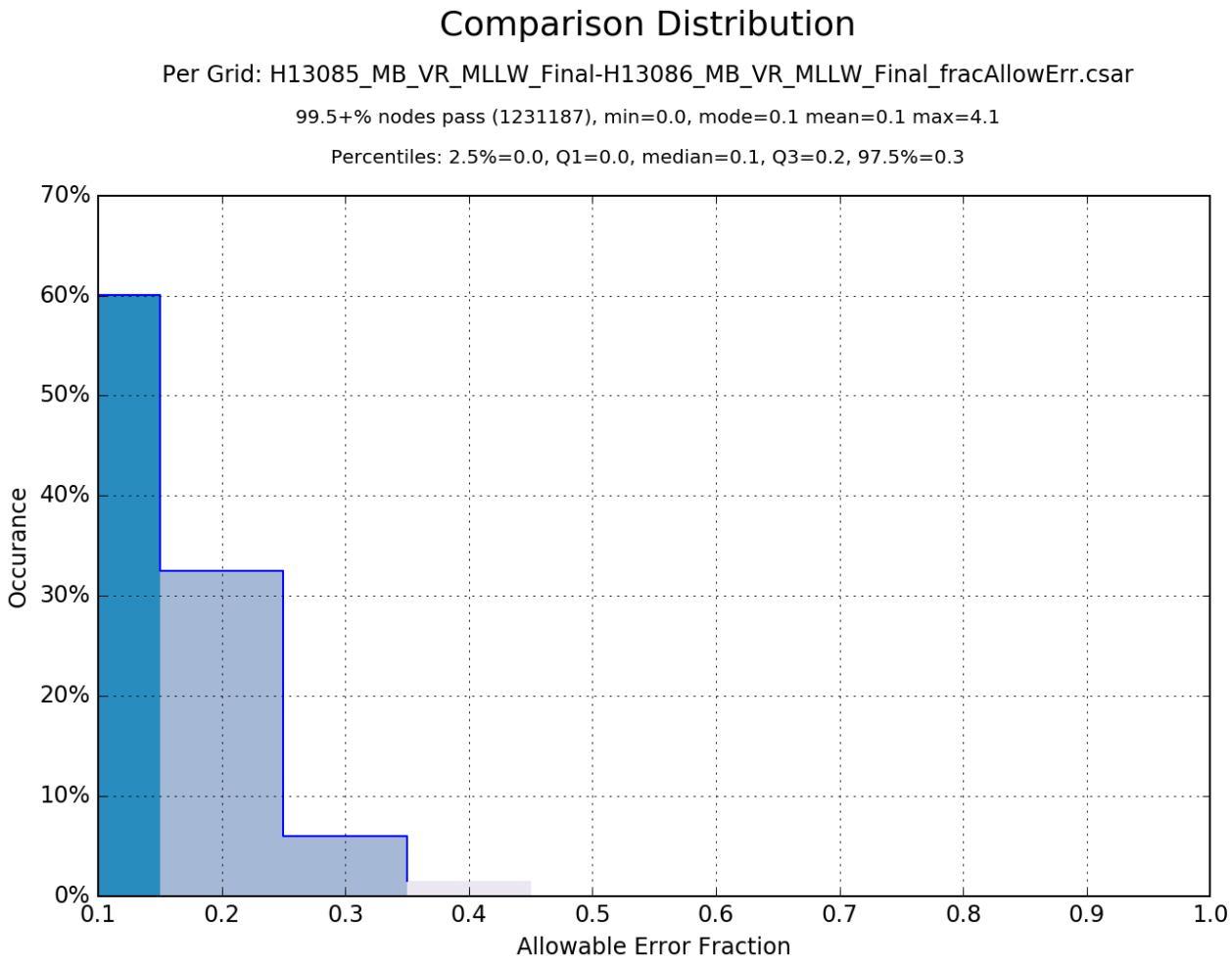


Figure 18: Pydro derived plot showing H13085 / H13086 VR surface comparison statistics.

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

2801 Roll Bias Adjustment

An intermittent, minor roll bias was noted on some H13085 2801 MBES data. Numerous possible equipment and software related issues were investigated, however at the time of this report, a conclusive

cause of the offset has yet to be determined. A value of -0.165 degrees roll was added to 2801_EM2040.hvf in order to address this slight bias. All submitted H13085 MBES data met HSSD specifications. Pydro QC Tools 2 derived histograms of IHO TVU compliance are shown below; post roll correction data showed minute improvement.

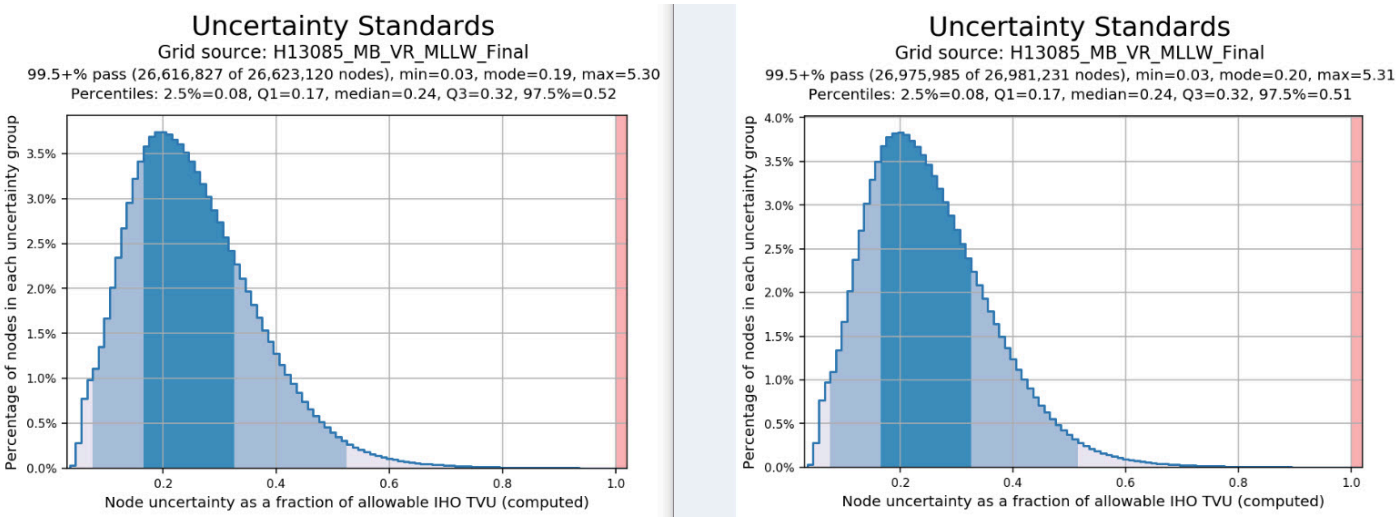


Figure 19: Pydro derived QC TVU histograms of pre (left) and post (right) roll corrected H13085 MBES data.

B.2.6 Factors Affecting Soundings

Suboptimal Sound Speed Correction

Due to water column variations such as thermal layering and salinity differences, a distinct demarcation of water masses was sometimes encountered in the field. At times this proved problematic in the acquisition and application of optimal sound speed correction data. Despite the best efforts of the hydrographers to conduct sufficient sound speed casts distributed spatially and temporally, in some areas sound speed correction was suboptimal. This was evidenced by the appearance of systematic artifacts in the survey grid and characteristic "smiles" or "frowns" of MBES data when viewed in subset editor. To address this issue, the Hydrographer rejected outer beam soundings obviously in error in an attempt to produce a surface that best represented the sea floor. All examined sound speed related offsets were determined to be within NOAA HSSD standards.

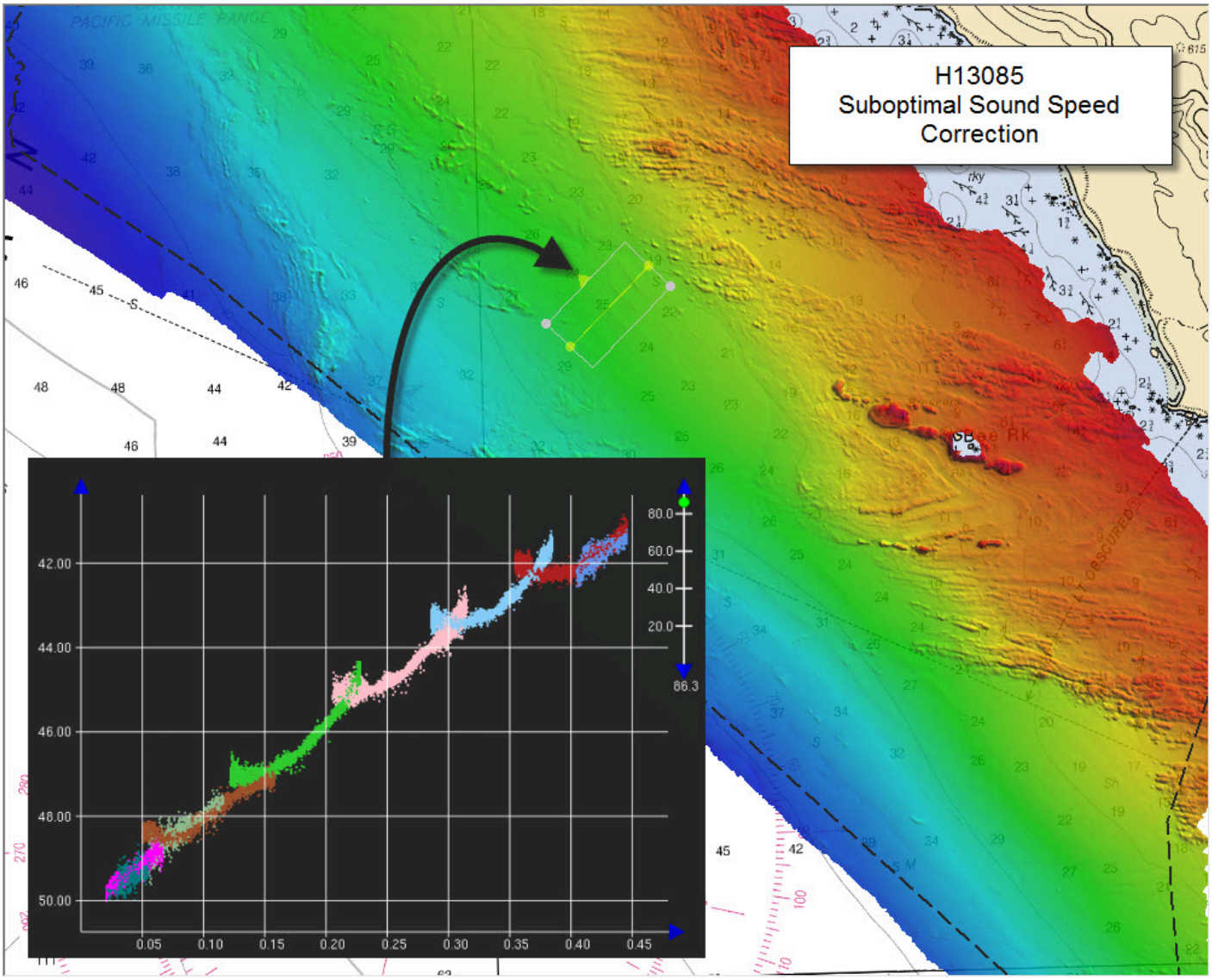


Figure 20: Example of area with suboptimal sound speed correction. Inset shows subset view of affected lines displaying characteristic "smiles."

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Fifty one sound speed profiles were acquired for this survey at discrete locations within the survey area at least once every four hours, when significant changes to surface sound speed were observed, or when operating in a new area. Sound speed profiles were acquired using Sea-Bird Scientific SBE 19plus profilers. All casts were concatenated into a master file and applied using the "Nearest distance within Time" (4 hours) profile selection method.

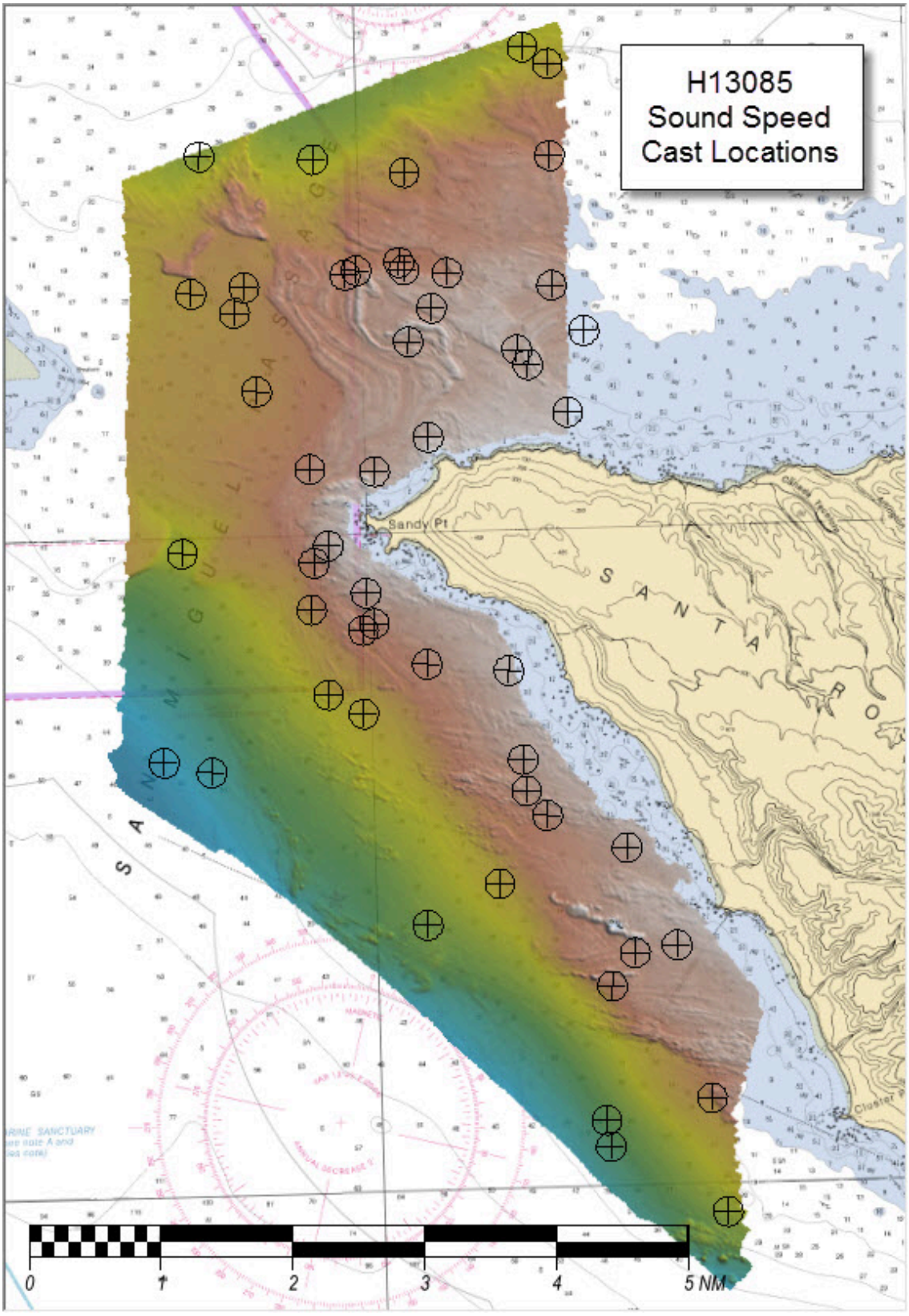


Figure 21: H13085 sound speed cast locations.

B.2.8 Coverage Equipment and Methods

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

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 was acquired as .all files logged during MBES operations and subsequently processed by personnel aboard RAINIER. The .GSF files created during processing and one backscatter mosaic per vessel per frequency has been delivered with this report. Backscatter processing procedures are described in the DAPR.

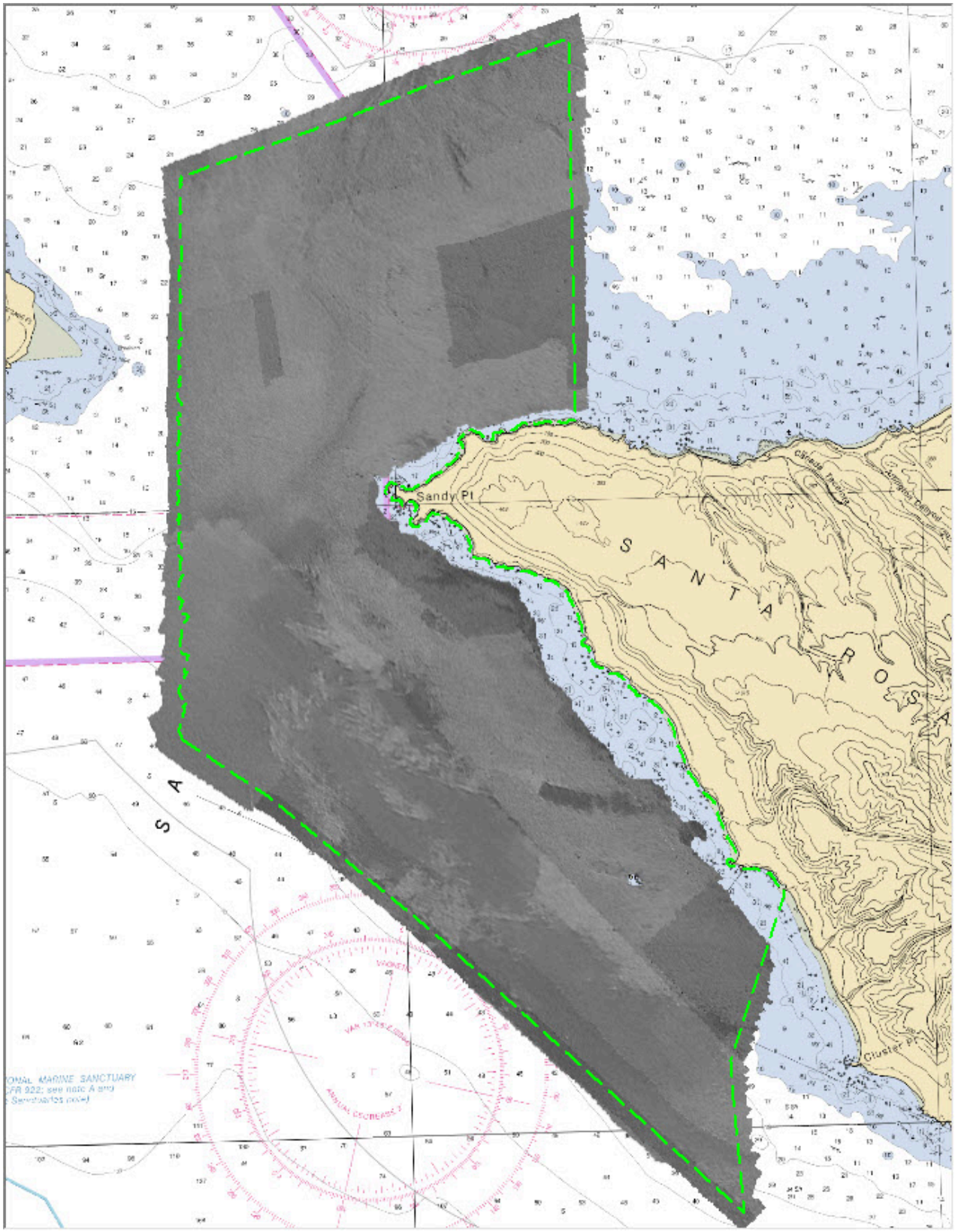


Figure 22: Overview of H13085 backscatter mosaics (Chart 18727).

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/SIPS	10.3

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 Geocoder Tool Box (FMGT)	7.8.1

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Extended Attribute file Version 5.7.

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
H13085_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	1.2 meters - 84.0 meters	NOAA_VR	Complete MBES
H13085_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution	1.2 meters - 84.0 meters	NOAA_VR	Complete MBES

Table 12: Submitted Surfaces

Submitted surfaces were generated using the NOAA recommended parameters for depth-based (Ranges) Caris variable-resolution bathymetric grids as specified in 2018 HSSD.

Ten critical soundings were designated for this survey, all were identified as Dangers to Navigation and processed appropriately. Pydro QC Tools 2 Detect fliers program with default settings was used to identify fliers in H13085 MBES data. After several iterations of running the program and rejecting obvious noise, the process was run again. The Hydrographer's opinion is that the remaining fliers are "false positives," due to the highly dynamic nature of the seafloor found in some areas of the survey. Pydro QC results are included in Appendix II of this report.

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying 2018 DAPR.

C.1 Vertical Control

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

Traditional Methods Used:

- TCARI

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

Station Name	Station ID
Los Angeles, CA	9410660
Santa Monica, CA	9410840
Santa Barbara, CA	9411340
Oil Platform Harvest, CA	9411406
Port San Luis, CA	9412110
Monterey, CA	9413450

Table 13: NWLON Tide Stations

There was no Water Level file associated with this survey.

File Name	Status
L397RA2018.tc	Final
H13085_TCARI_Features.tid	Final

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

A request for final approved tides was sent to N/OPS1 on 10/28/2018. The final tide note was received on 01/29/2019.

H13085 shoreline features were reduced to chart datum (MLLW) using a .tid file created in Pydro utilizing the "TCARI TID file via S-57" function, then loaded in Caris Notebook. H13085 MBES data were reduced to MLLW using ERS via VDATUM processing methods. See Supplemental Correspondence regarding approval of traditional tides for use in determining feature heights.

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_RA_18_lgECpoly_xyNAD83-MLLW_geoid12b.csar

Table 15: ERS method and SEP file

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 10.

WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control for this survey.

C.3 Additional Horizontal or Vertical Control Issues

C.3.1 SBET Processing Method

Precise Positioning-Real Time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS 8.2.1 software to produce SBETs for post-processing horizontal correction.

D. Results and Recommendations

D.1 Chart Comparison

A comparison was made between H13085 survey data and Electronic Navigational Chart (ENC) US5CA64M using CUBE surfaces, selected soundings and contours created in Caris.

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?
US5CA64M	1:40000	10	08/24/2018	10/30/2018	NO

Table 16: Largest Scale ENCs

US5CA64M

ENC US5CA64M covers all of the H13085 survey area. The following comparison between survey data and US5CA64M was conducted after the ENC was updated with ten H13085 submitted Dangers to Navigation.

H13085 MBES data extended inshore to the 3-fathom contour where safe to do so, however hazardous conditions prevented complete coverage throughout the assigned area. Where a comparison was possible, the ENC 3-fathom curve followed the survey derived 3-fathom contour generally but discrepancies of up to 200 meters were found. Some H13085 derived 3-fathom depths located in offshore areas such as Talcott Shoal and Bee Rock, were not included in the ENC (Figure 23).

ENC 5-fathom depth curves agreed generally with H13085 derived 5-fathom depth contours, however in some places such as Talcott Shoal and Bee Rock, 5-fathom survey depth areas were more extensive than charted (Figure 24).

H13085 and ENC 10-fathom depth contours showed good general agreement as shown in Figure 25.

In the deeper areas of the survey, ENC 20, 30 and 40-fathom depth curves agreed with H13085 derived data generally within 100-300 meters. The largest discrepancy was found in the the northwest part of the survey area where ENC and H13085 20-fathom contours disagreed significantly, with the survey depth contour trending south and the ENC depth curve trending further north and west (Figure 26).

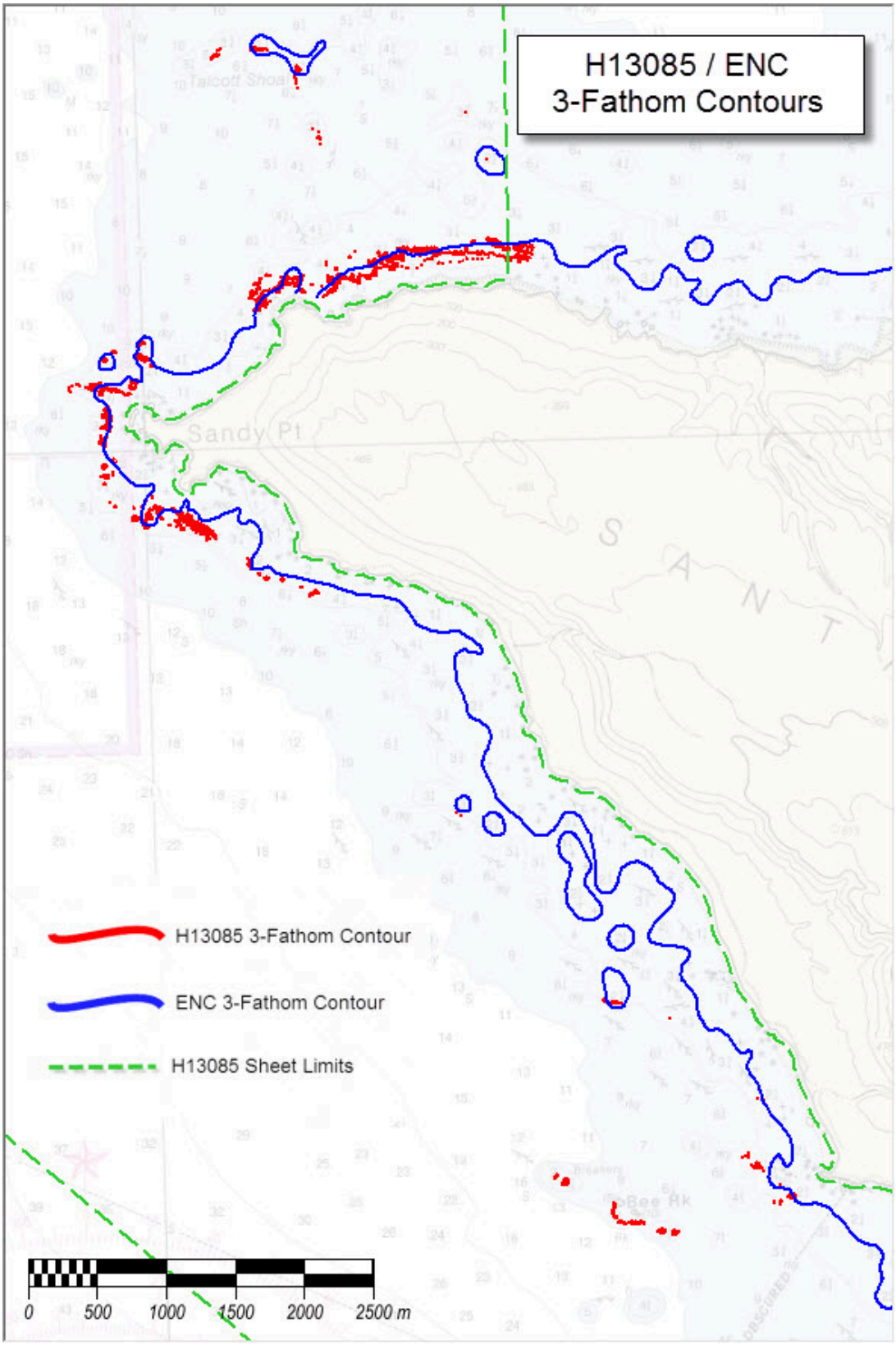


Figure 23: H13085 derived 3-fathom contour (shown red) compared with ENC US5CA64A 3-fathom depth curve (shown blue).

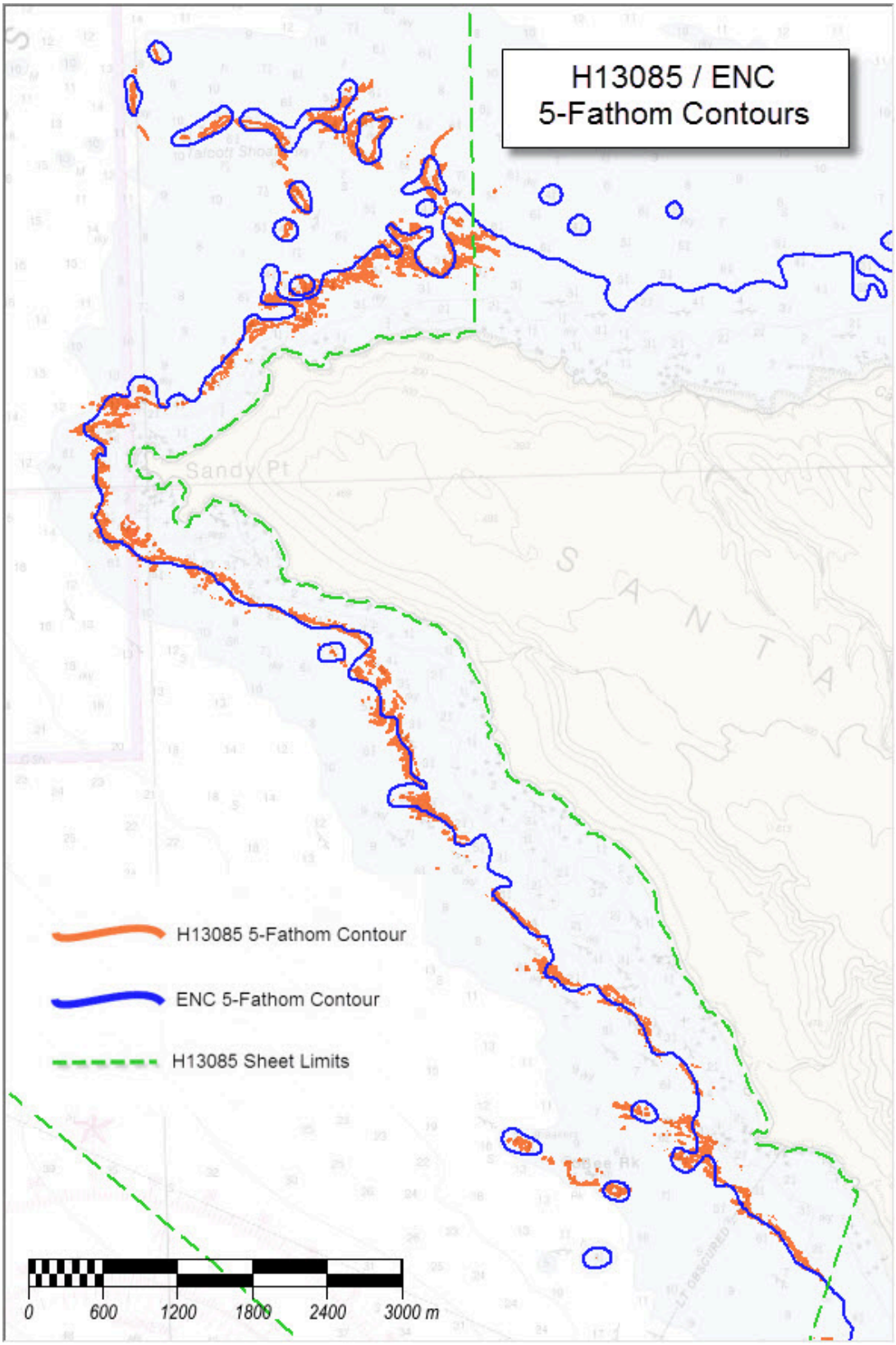


Figure 24: H13085 derived 5-fathom contour (shown brown) compared with ENC US5CA64A 5-fathom depth curve (shown blue).

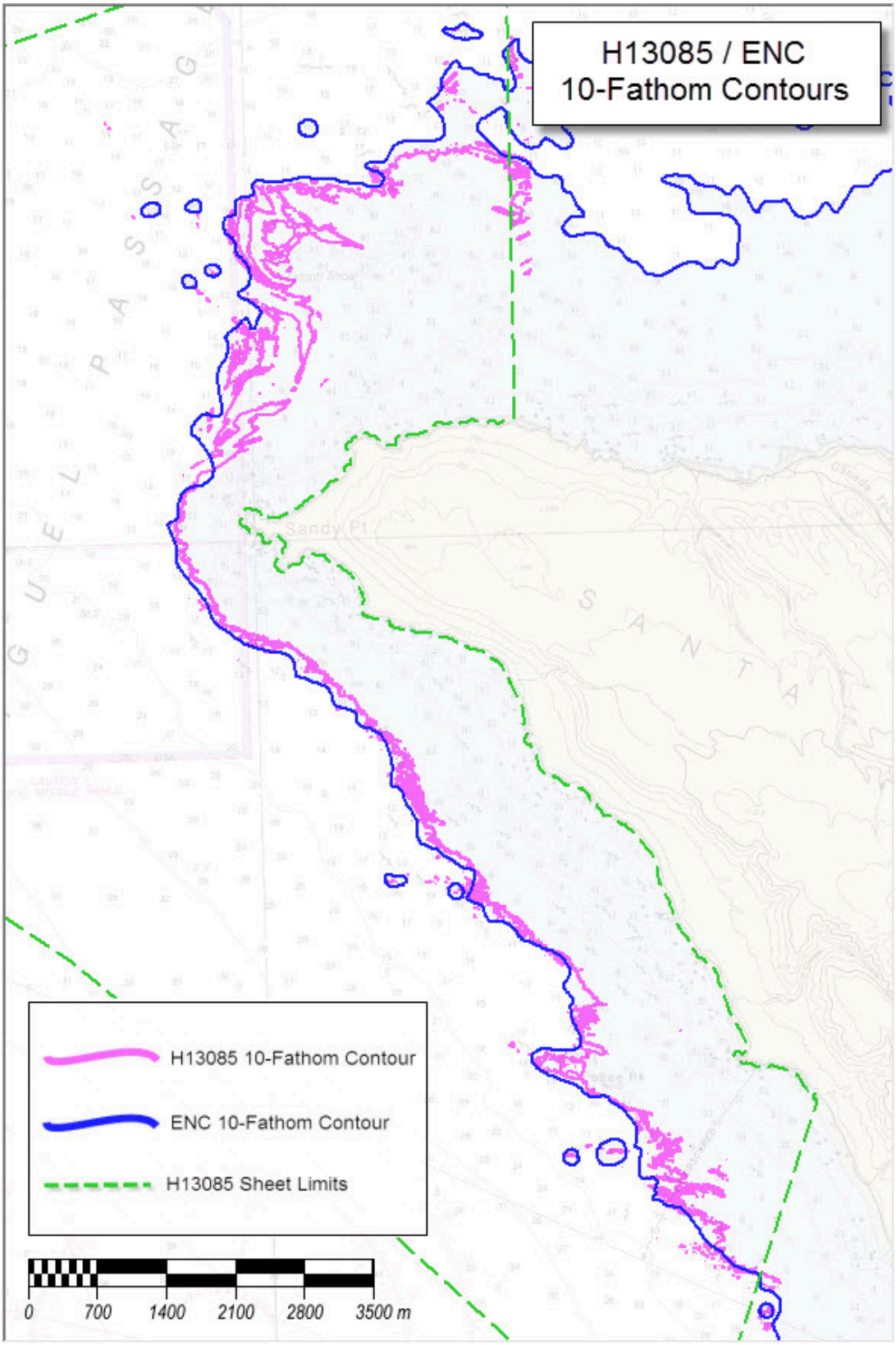


Figure 25: H13085 derived 10-fathom contour (shown magenta) compared with ENC US5CA64A 10-fathom depth curve (shown blue).

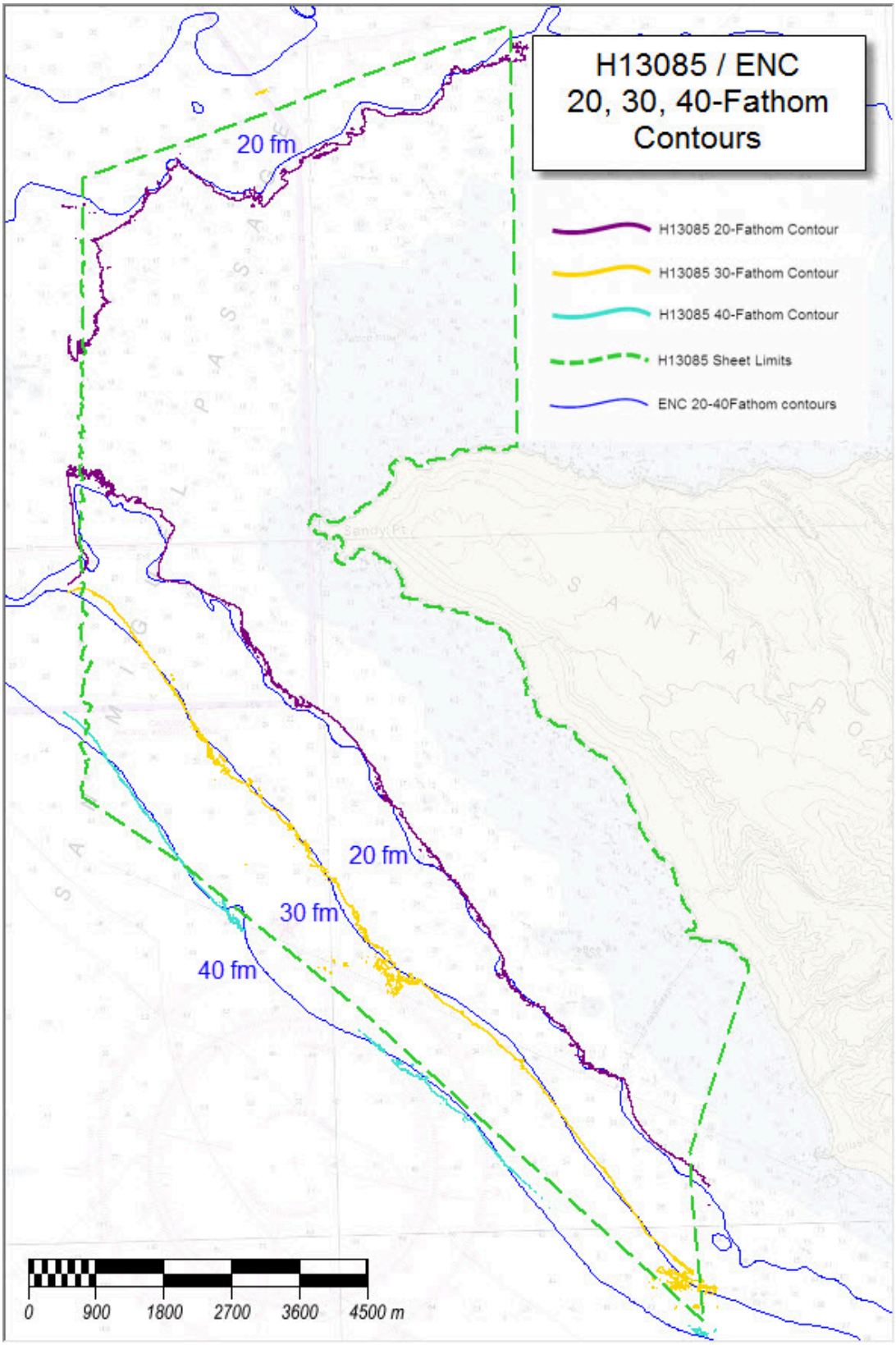


Figure 26: H13085 derived 20, 30 and 40-fathom contours compared with their corresponding ENC (US5CA64A) depth curves.

D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.3 Charted Features

A dangerous underwater rock of uncertain depth is charted approximately 180 meters south of Sandy Point; it was reported in 1995. Unsafe conditions prevented H13085 survey coverage over the rock, however breaking waves were observed at its charted location.

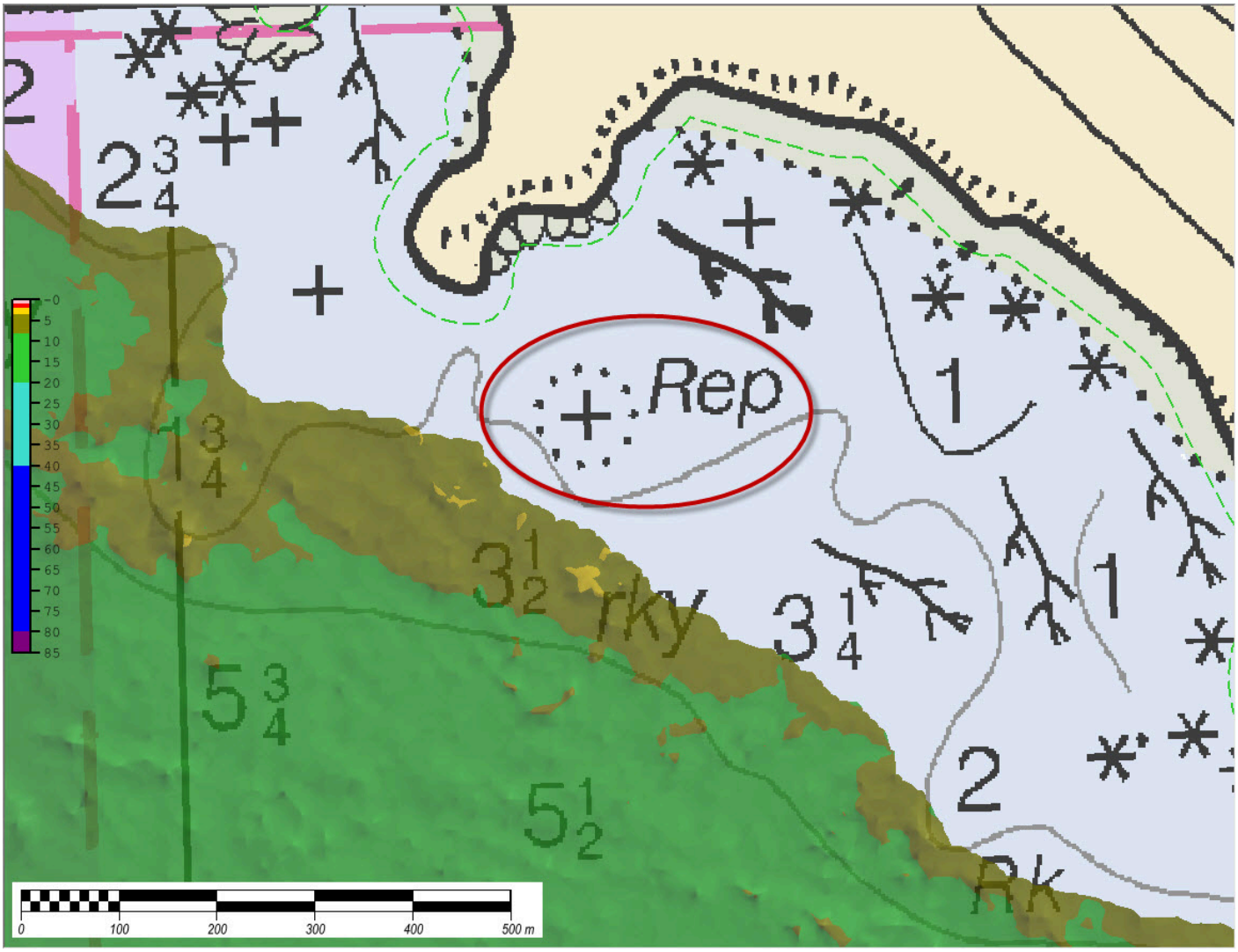


Figure 27: Location of reported dangerous underwater rock (Chart 18727).

D.1.4 Uncharted Features

There are no new features that have not been discussed elsewhere in this report.

D.1.5 Shoal and Hazardous Features

A total of ten Dangers to Navigation (DTON) were identified within the H13085 survey area and submitted to the Office of Coast Survey Nautical Data Branch in three separate reports. All ten DTONs have been applied to applicable NOAA charting products. See Supplemental Correspondence folder for further information.

D.1.6 Channels

There are no maintained channels, designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the H13085 survey area.

D.1.7 Bottom Samples

There was no bottom sample investigation requirement for this survey.

D.2 Additional Results

D.2.1 Shoreline

Limited shoreline verification was conducted within the H13085 survey area using the Composite Source File (CSF) provided by NOAA HSD Operations Branch. In the field, all assigned features that were deemed safe to approach, were addressed as required with S-57 attribution and recorded in the H13085 Final Feature File (FFF) to best represent features at chart scale. This file also includes new features found in the field as well as recommendations to update, retain or delete assigned features. During survey operations, the Navigable Area Limit Line was reached well offshore of most assigned features, imposing significant limitations on investigation. Features that were unsafe to approach were attributed in the FFF as Not Addressed and the reason stated.

D.2.2 Aids to Navigation

No Aids to navigation (ATONs) are located within the H13085 survey area.

D.2.3 Overhead Features

No overhead features are located within the H13085 survey area.

D.2.4 Submarine Features

No submarine features such as cables, pipelines or tunnels are located within the H13085 survey area.

D.2.5 Platforms

No platforms or other drilling structures are located within the H13085 survey area.

D.2.6 Ferry Routes and Terminals

No charted ferry routes or terminals are located within the H13085 survey area.

D.2.7 Abnormal Seafloor and/or Environmental Conditions

H13085 MBES data includes areas of highly dynamic bathymetry, especially north of Sandy Point on Santa Rosa Island. Vertical relief in that area is up to 12 meters.

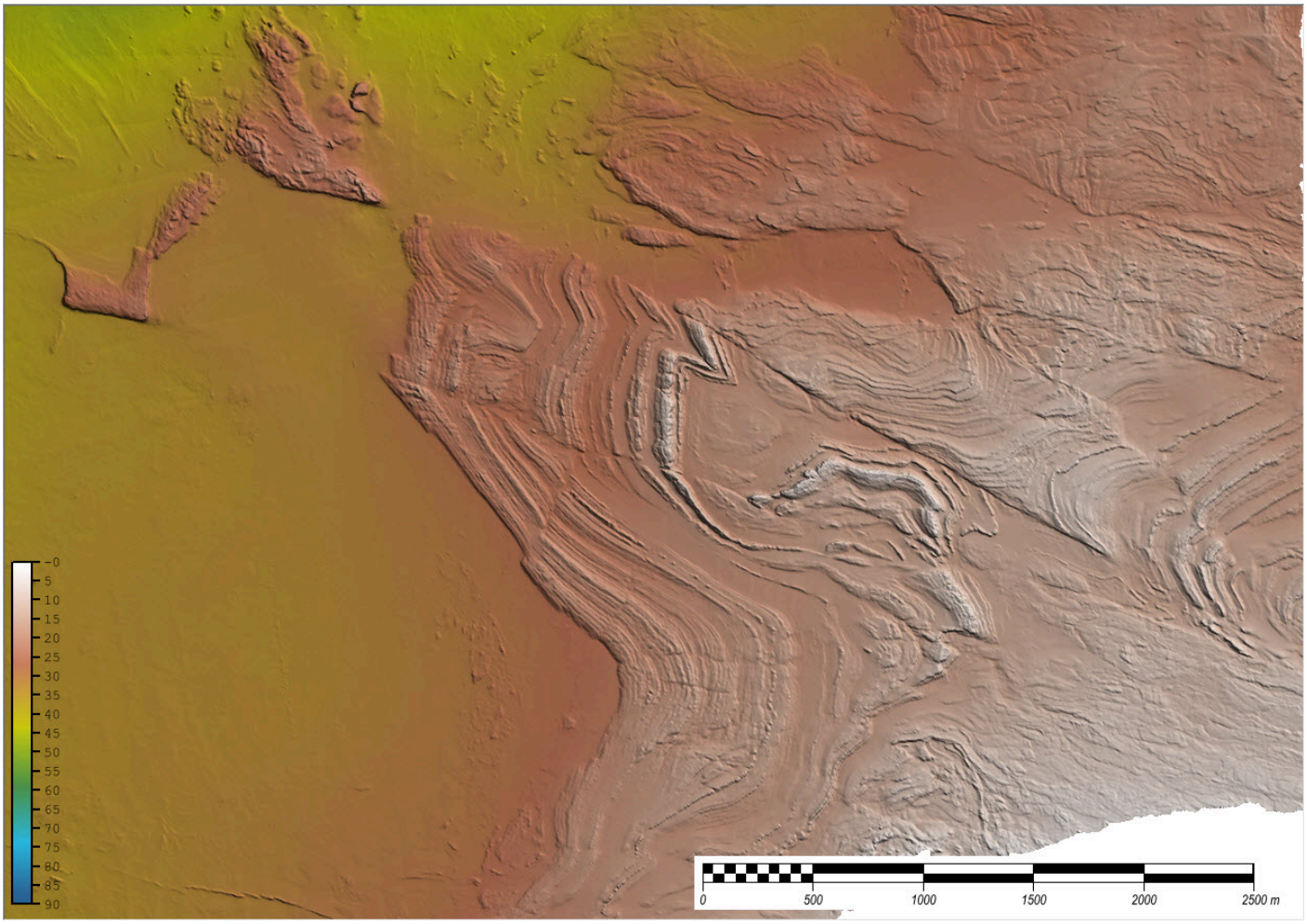


Figure 28: Example of H13085 dynamic seafloor (surface exaggeration = 3).

D.2.8 Construction and Dredging

No present or planned construction or dredging exist within the H13085 survey area.

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
Benjamin K. Evans, CDR/NOAA	Commanding Officer	03/12/2019	Digitally signed by EVANS.BENJAMIN.K.1237217094 Date: 2019.03.12 20:46:14 -07'00'
Andrew R. Clos, LT/NOAA	Field Operations Officer	03/12/2019	Digitally signed by OWEN.HADLEY.ANNE.1410967070 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=OWEN.HADLEY.ANNE.1410967070 Date: 2019.03.12 11:08:26 -07'00'
James B. Johnson	Chief Survey Technician	03/12/2019	JACOBSON.JAMES.BRYAN.1269664017 I have reviewed this document 2019.03.12 12:17:45 -07'00'
B.D. Jackson	Senior Survey Technician	03/12/2019	B Jackson

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
TPU	Total Propagated Uncertainty
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 DEPARMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : December 6, 2018

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-L397-RA-2018
HYDROGRAPHIC SHEET: H13085

LOCALITY: East San Miguel Passage and Vicinity
California
TIME PERIOD: September 26 - October 21, 2018

TIDE STATION USED: Los Angeles, CA 9410660
Lat. 33° 43.2' N Long. 118° 16.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.448 meters

TIDE STATION USED: Santa Monica, CA 9410840
Lat. 34° 0.5' N Long. 118° 30.0' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.428 meters

TIDE STATION USED: Santa Barbara, CA 9411340
Lat. 34° 24.2' N Long. 119° 41.6' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.415 meters

TIDE STATION USED: Oil Platform Harvest, CA 9411406
Lat. 34° 28.1' N Long. 120° 40.9' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.373 meters

TIDE STATION USED: Port San Luis, CA 9412110
Lat. 35° 10.1' N Long. 120° 45.2' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.408 meters

TIDE STATION USED: Monterey, CA 9413450
Lat. 36° 36.3' N Long. 121° 53.3' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.412 meters

REMARKS: RECOMMENDED Grid

Please use the TCARI grid "L397RA2018.tc" as the final grid for project OPR-L397-RA-2018, H13085, during the time period between September 26 and October 21, 2018.

Refer to attachments for grid information.

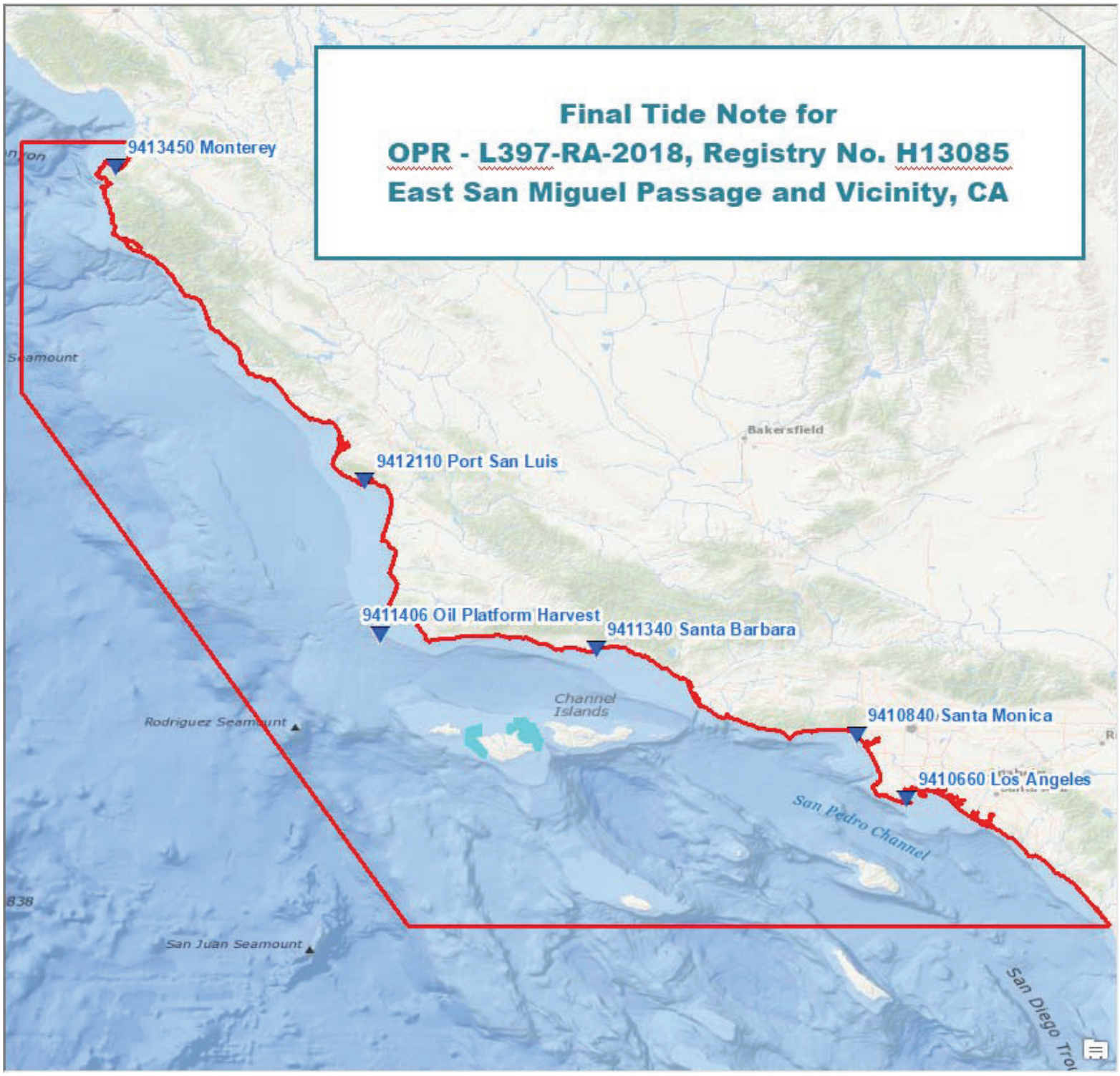
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: Annual leveling for Santa Barbara, CA (9411340), Oil Platform Harvest, CA (9411406), and Monterey, CA (9413450) was not completed in FY18. A review of the verified leveling records from November 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-L397-RA-2018, H13085. 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.

FANELLI.COLLEEN.MEGHAN.1369720100

Digitally signed by FANELLI.COLLEEN.MEGHAN.1369720100
Date: 2018.12.12 15:47:14 -05'00'

ACTING CHIEF, PRODUCTS AND SERVICES BRANCH


Final Tide Note for
OPR - L397-RA-2018, Registry No. H13085
East San Miguel Passage and Vicinity, CA
9413450 Monterey
9412110 Port San Luis
9411406 Oil Platform Harvest
9411340 Santa Barbara
9410840 Santa Monica
9410660 Los Angeles
Bakersfield
Channel Islands
Rodriguez Seamount
San Juan Seamount
San Pedro Channel

Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

Fwd: When run lines for relative backscatter calibration?

1 message

OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> Sat, Oct 6, 2018 at 10:49 PM
To: Jim Jacobson <ChiefST.Rainier@noaa.gov>, Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>, Audrey Jerauld - NOAA Federal <audrey.jerauld@noaa.gov>, Gregory Gahlinger - NOAA Federal <gregory.gahlinger@noaa.gov>, Amanda Finn - NOAA Federal <amanda.finn@noaa.gov>, Carl Stedman - NOAA Federal <carl.r.stedman@noaa.gov>, Jonathan Witmer - NOAA Federal <jonathan.witmer@noaa.gov>, Michael Card - NOAA Federal <michael.card@noaa.gov>, Airlie Pickett - NOAA Federal <airlie.pickett@noaa.gov>, Nicholas Azzopardi - NOAA Federal <nicholas.azzopardi@noaa.gov>, Collin Walker - NOAA Federal <collin.walker@noaa.gov>, Christopher Dunn - NOAA Federal <christopher.dunn@noaa.gov>, Stefanie Coxe - NOAA Federal <stefanie.coxe@noaa.gov>, Lyle Robbins - NOAA Federal <lyle.robbins@noaa.gov>, Samuel Umfress - NOAA Federal <samuel.umfress@noaa.gov>, Hadley Owen - NOAA Federal <hadley.a.owen@noaa.gov>
Cc: Bryan Costa - NOAA Federal <bryan.costa@noaa.gov>

Hi Everyone,

Here are the Decibel Offset values for the launches when processing different boats in FMGT. I have added this to the FMGT Backscatter SOP as well. Please use these when processing backscatter on your sheets. Thank you, Bryan!

Launch	Decibel Offset
2801	-1.2
2802	-0.6
2803	-0.9
2804	-0.3

Thank you,
Andrew

Operations Officer
NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365

Ship Cell: (541) 272-9430
Iridium: (808) 659-0049
Email: Ops.Rainier@noaa.gov

---------- Forwarded message ---------
From: **Bryan Costa - NOAA Federal** <bryan.costa@noaa.gov>
Date: Sat, Oct 6, 2018 at 2:51 PM
Subject: When run lines for relative backscatter calibration?
To: OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov>

Hi Andrew,
I was wondering when the launches will run the same line to conduct a relative calibration?
Also, FYI-- I pasted the dB offsets from last year below.

Cheers,Bryan

Launch	Decibel Offset
2801	-1.2
2802	-0.6
2803	-0.9
2804	-0.3

--

Bryan Costa
Marine Ecologist

Biogeography Branch, Marine Spatial Ecology Division
National Centers for Coastal Ocean Science
NOAA National Ocean Service
University of California Santa Barbara
Ocean Science Education Building 514, MC 6155
Santa Barbara, CA 93106-6155
Phone: (805) 893-6439
Fax: (805) 893-6438

Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

Fwd: Re: offset issue?

1 message

chiefst.rainier <chiefst.rainier@noaa.gov> Fri, Mar 8, 2019 at 4:45 PM
To: Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

FYI

-------- Forwarded Message --------
Subject: Re: offset issue?
Date: Tue, 05 Mar 2019 08:28:09 -0800
From: Grant Froelich <grant.froelich@noaa.gov>
To: OPS - Rainier <ops.rainier@noaa.gov>
CC: CST RAINIER <chiefst.rainier@noaa.gov>, shelley.devereaux@noaa.gov

Hi Hadley,

Sorry for the delay, I was in CARIS training all day yesterday.

It is certainly strange as to why you would have a roll artifact in your data that changes. I guess it depends on how frequently the roll bias is changing during the day (ie, if it is changing with the swell/wave period it is probably roll stabilization/correction related. if it is changing slowly through a period of a day it is probably a physical mounting issue).

Some potential causes that come to mind as I think about this as I write stream of consciousness :

Physical problems (ie mounts):
Loose transducer mount
Loose IMU (although it would be very strange to only be loose in the athwart-ships axis...)

Software/hardware problems:
Roll stabilization latency somewhere between IMU and SIS
Roll stabilization values from POS MV incorrect
Roll stabilization not applied/double applied
Bad IMU initialization (although would be strange to be occurring multiple days)

If I think of any more potential culprits I'll let you know.

grant

--

Grant Froelich
Hydrographic Team Lead
NOAA's National Ocean Service
Office of Coast Survey, Hydrographic Surveys Division
Pacific Hydrographic Branch, N/CS34
7600 Sand Point Way N.E.
Seattle, WA 98115-6349

w: (206)526-4374 | grant.froelich@noaa.gov

> On 3/4/2019 11:02:13 AM, OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> wrote:

Hi Grant -

So Jim, Jackson, and Card were looking into this offset issue while I was on the Shimada last week. They wound up with a range of numbers that were best fit on each CINMS and LA/LB sheet (the launch surveys), from -0.224 to -0.066. I believe the one that required the least adjustment (H13201) was actually the deepest survey.

We are rerunning surfaces with the different offset values per sheet, and are going to look at the QC to see if before or after is better, and then will write about it in the DR. However, do you have any thoughts as to why we would have pretty significant differences in the working roll offset values per sheet? Especially since all of the data was acquired within the same 1 to 2 month period?

Spreadsheet with numbers as determined by the team is attached.

Hadley

Operations Officer
NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365

Ship Cell: (541) 272-9430
Iridium: (808) 659-0049
Email: Ops.Rainier@noaa.gov

On Wed, Feb 20, 2019 at 9:13 PM Grant Froelich <grant.froelich@noaa.gov> wrote:

> Hadley,
>
> No worries. I enjoy getting down into the weeds with technical issues and seem to rarely get to do it as much as I used to.
>
> If you find that there is a consistent issue with 2801, you can address it in the documentation either in the individual DRs or in the DAPR. From a HSSD perspective, either is acceptable and doesn't really make an impact during SAR one way or the other. If the values in the DAPR don't correspond to the .hvf then we go looking in the DR to see if the mismatch is addressed there. But since we have the DR already open it's a pretty inconsequential step for the SARer. The DAPR was originally conceived as a easier way to talk about common items shared between surveys of the same project so you don't have to say the same thing 5 or 6 times. But I know that sometimes DAPR maintenance and version control can make updating it a bit of a pain and updating the individual DRs can be, ironically, easier.
>
> grant
>
> --
>
> Grant Froelich
> Hydrographic Team Lead
> NOAA's National Ocean Service
> Office of Coast Survey, Hydrographic Surveys Division
> Pacific Hydrographic Branch, N/CS34
> 7600 Sand Point Way N.E.
> Seattle, WA 98115-6349
>
> w: (206)526-4374 | grant.froelich@noaa.gov

> On 2/20/2019 1:03:01 PM, OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> wrote:
>
> Grant -
>
> Thanks very much for the detailed response. Just as an interim follow-up, as we are looking more closely into subsequent launch data, it seems like there might actually be continued 2801 issues.

We are in the process of seeing how the data is affected by the roll change, and will determine how to move forward from there.

I assume if we decide this is a consistent 2801 issue, we will plan on updating the value in the common 2801 .hvf and thus in the DAPR, as well? As opposed to discussing it in individual DRs?

Thanks for the help,
Hadley

Operations Officer
NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365

Ship Cell: (541) 272-9430
Iridium: (808) 659-0049
Email: Ops.Rainier@noaa.gov

On Tue, Feb 19, 2019 at 4:24 PM Grant Froelich <grant.froelich@noaa.gov> wrote:

> Hi Hadley,
>
> Thanks for asking!
>
> My initial thoughts immediately after reading are that even if this was discovered recently and not all that noticeable in other datasets, there is only one true seafloor (ie everything else being equal, you can't have two different depths for the seafloor in the same location) and if putting in a 0.25 degree roll correction makes the data line up better to show that there is only one seafloor then it seems like, empirically, a 0.25 degree roll correction is needed for that vessel.
>
> I think there are a couple of ways forward (listed in order of my personal preference):
>
> 1) Since this is for an Object Detection survey and because we will want to use it for Precision Navigation products where every centimeter counts (bIENCs with high density, high precision contours), having the best data quality possible is clearly preferred. I am probably biased since I manage the data and make those bIENCs for LB/LB, but I think it remains a true statement.
>
> Since you have already determined the magnitude of the correction needed to bring the data into better alignment, which is usually the hard part, I would apply that value to your data and recompute your surfaces, check for "new" fliers, and check your VALSOUs from any features determined by MBES still match the FFF.
>
> 2) Leave the HVF as is and document the remaining residual bias in the DR. If the data meets spec, it meets spec and we couldn't/wouldn't return a survey to you if data *almost* didn't meet spec. But you have to be absolutely very sure it still meets spec. If we find the data doesn't meet spec and the DR indicates you were aware of the issue and chose not to correct it, it doesn't go down well with the SARer. If you chose this route, you should increase your Roll TPU uncertainty value since you are now aware that that patch test value is not as accurate as you once believed. You would have to examine your TPU values again to be sure that the new roll bias uncertainty did not push the data out of the Uncertainty budget.
>
> Note relevant sections of the HSSD:
>
> Error Budget
> Section 5.2.3.1 states "Comparisons should be conducted during calm sea conditions, preferably in areas with a relatively flat bottom. Any differences should be investigated, and if, after analysis, a corrector is necessary, it should be applied with an explanation of the cause of the difference explained in the Descriptive Report (DR) Section 8.1.4 B.2, Quality Control."
>
> Section 5.2.3.5 states "The error ranges provided below are first order estimates to allow hydrographers to get a basic ‘feel’ for the possible range in errors that may occur in practice. The

required depth accuracy requirements cannot be achieved if the greatest error for each sensor shown below is used.

...

Measurement error: This includes the instrument error for the sounding system, the effects of imperfectly measured roll/pitch and errors in detection of the sea floor due to varying density of the bottom material. Multibeam systems are particularly susceptible to this error due to the off-nadir nature of outer beams. The minimum achievable value is expected to be 0.20 m at 10 m depth. The maximum allowable error is 0.30 m plus 0.5% of the depth."

Uncertainty Budget
Section 5.2.3.6 states "The uncertainty component values provided below are estimates to allow hydrographers to get a basic “feel” for the possible uncertainty values that may occur in practice. The values discussed below are at the 68% confidence level (i.e., 1 sigma).

Motion Sensor Uncertainties: These values include heave, pitch and roll measurement uncertainties and can include gyro measurement uncertainty. A common value for gyro, pitch and roll measurement uncertainty is 0.02°. A common value for heave uncertainty is 5% of the heave amplitude or 0.05 m, whichever is greater.

FYI...As I look at the screen shot you sent with the error, it would appear that the combined maximum error (as opposed to the increased uncertainty in your Roll Bias value) exceeds the Measurement Error section of the HSSD (0.3m + 0.5% of 24m = 0.42m). I am crudely estimating a maximum measurement error value of approx 1m based on that image but that may not be accurate since I am doing this off a screen shot. See attached. Note the screen shot is in subset so also includes any other errors listed in the error budget (draft, sound speed, heave, vertical datum correction) but I suspect that most of that 1m comes from a roll bias error and would therefore be out of spec. Also, I suspect if you increased your Roll TPU value to account for the increased uncertainty in the patch test value, you would see areas of the survey that no longer meet the uncertainty specs. Would it be more than 5% of nodes? Hard to say. But based on that image and my crude measuring, I would strongly advise for Option 1.

grant

--

Grant Froelich
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NOAA's National Ocean Service
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w: (206)526-4374 | grant.froelich@noaa.gov

> On 2/15/2019 4:27:47 PM, OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> wrote:
>
> Hi Grant -
>
> So, I am working on sheet H13198 of the Rainier's LA/Long Beach project (S-L318-RA-18), and have some noticeable left-down offset appearing in the lines acquired from launch 2801. The survey area was so flat that it was almost acting like it was its own

patch test. However, the difference between the opposite edges of the swath on subsequent lines is only barely in spec for the depth (~20-25m), and there was concern regarding how much of the error budget is being used up with this characteristic.

Attached are images with of the surface with 2D subset of a few lines from 2801. One is with the original .hvf, and the other is with a -0.25 degree roll offset set in a trial .hvf for 2801. The main concerns are, one, there is nothing new that was changed in this boat either before or after the survey, and the issue (per Andrew) is perhaps visible but not nearly as big in other data from 2801 on other surveys. And thus this is a somewhat arbitrary adjustment. And, two, it is for an Object Detection survey and thus an unexplained offset is generally more concerning regarding data quality. However, the new offset seems to improve the 2801 data throughout the sheet.

Greg Gahlinger has been working with his data, and while the issue is noticeable in there as well, I am not sure of the quantitative specifics. He also had significant issues with sector holidays from yaw stabilization, so has many areas of his survey with close to 200% coverage from needing to rerun so many regions (and I'm not sure of how much of that was run by 2801, anyway).

We have talked a bit about this on the ship (Andrew, Chief Jacobson, and I) and thought it was a question to punt to you for advice on what do with this issue. What are you thoughts? And how do you recommend I address it going forward? Leave the original .hvf and discuss in the DR? Ignore the issue since it is within spec? :-D

Let me know if there is any additional information I can send to you to help you understand the problem. Thanks very much for any help/advice.

Best,
Hadley

Operations Officer
NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365

Ship Cell: (541) 272-9430
Iridium: (808) 659-0049
Email: Ops.Rainier@noaa.gov

Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

USGS Bathy in H13085

2 messages

OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> Tue, Sep 25, 2018 at 7:29 PM
To: Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>, Jim Jacobson <ChiefST.Rainier@noaa.gov>

Hi Jackson,

We received a TIFF of bathymetry that overlaps with your sheet in the Channel Islands. They've instructed us to begin working on areas where this bathymetry does not overlap while the branch determines whether or not we want to use this outside source data for charting. No need to rework any polygons at this point, the plan will just be to start acquiring data on your sheet on Wednesday in the northern portion.

The tiff has been placed in: K:\Projects\2018_Projects\OPR-L397-RA-18_CINMS\Junction Surveys

Thank you,
Andrew

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Barry Jackson - NOAA Federal <barry.jackson@noaa.gov> Tue, Sep 25, 2018 at 9:00 PM
Draft To: ops <ops.rainier@noaa.gov>

Andrew,

Understood, I'm making a boat sheet that shows the USGS coverage to help the boat crews figure out where to work.

Thanks,

jackson
[Quoted text hidden]

Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

Fwd: Release of New Data Around SRI

1 message

OPS Rainier - NOAA Service Account <ops.rainier@noaa.gov> Wed, Oct 10, 2018 at 7:42 PM
To: Barry Jackson - NOAA Federal <barry.jackson@noaa.gov>

Jackson -

Here is the final email in the chain. If it looks like anything is missing, let me know; sometimes emails get missed when there are multiple "Reply All"s. Sorry this didn't get to you earlier.

Regards,
Hadley
Operations Officer
NOAA Ship *Rainier*
2002 SE Marine Science Drive
Newport, OR 97365

Ship Cell: (541) 272-9430
Iridium: (808) 659-0049
Email: Ops.Rainier@noaa.gov

---------- Forwarded message ---------
From: **CO RAINIER** <co.rainier@noaa.gov>
Date: Wed, Sep 26, 2018 at 9:21 PM
Subject: Re: Release of New Data Around SRI
To: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>, Ryan Freedman - NOAA Affiliate <ryan.m.freedman@noaa.gov>
Cc: OPS. Rainier <ops.rainier@noaa.gov>, Corey Allen <Corey.Allen@noaa.gov>, Chris Caldow - NOAA Federal <chris.caldow@noaa.gov>, Grant Froelich - NOAA Federal <grant.froelich@noaa.gov>

Meredith, et al.,

Ok - I understand this to mean that we are now tasked with completing the entirety of H13085 as originally planned.

For what it is worth, I think this is the right call for both the nautical charting and habitat mapping requirements. LT Clos was able to download the USGS data and compare it to our H13084 dataset from last year (there is a significant area of overlap with this sheet in the vicinity of the east end of San Miguel Island). He found fair agreement between the two datasets, with a mean difference: 0.457m and stdev: 0.511m in ~40m of water. (This compares to a mean difference of 0.01m and std deviation of 0.16m between H13084 and adjacent H13082 in similar depth ranges.) With only the gridded data set from USGS available, it is hard to tell what the source of this residual is. Given the magnitude, my guess is that their dataset was corrected for transducer draft, but possibly not tides. However, the dominant source of uncertainty is likely high variability at the outer edges of the swath, which is typical for interferometric systems.

We also noted a large number of holidays, and missed least depths over rocks. As a result, we would want to re-run acquire a large portion of this survey to address those issues prior to applying it to the charts. The FOO's rough estimate is that the difference between doing these fills only and full re-acquisition is only about 50 linear nautical miles of survey, or less than two boat days. This seems a fair price to pay for a complete, modern, and internally consistent survey around the island.

Ben

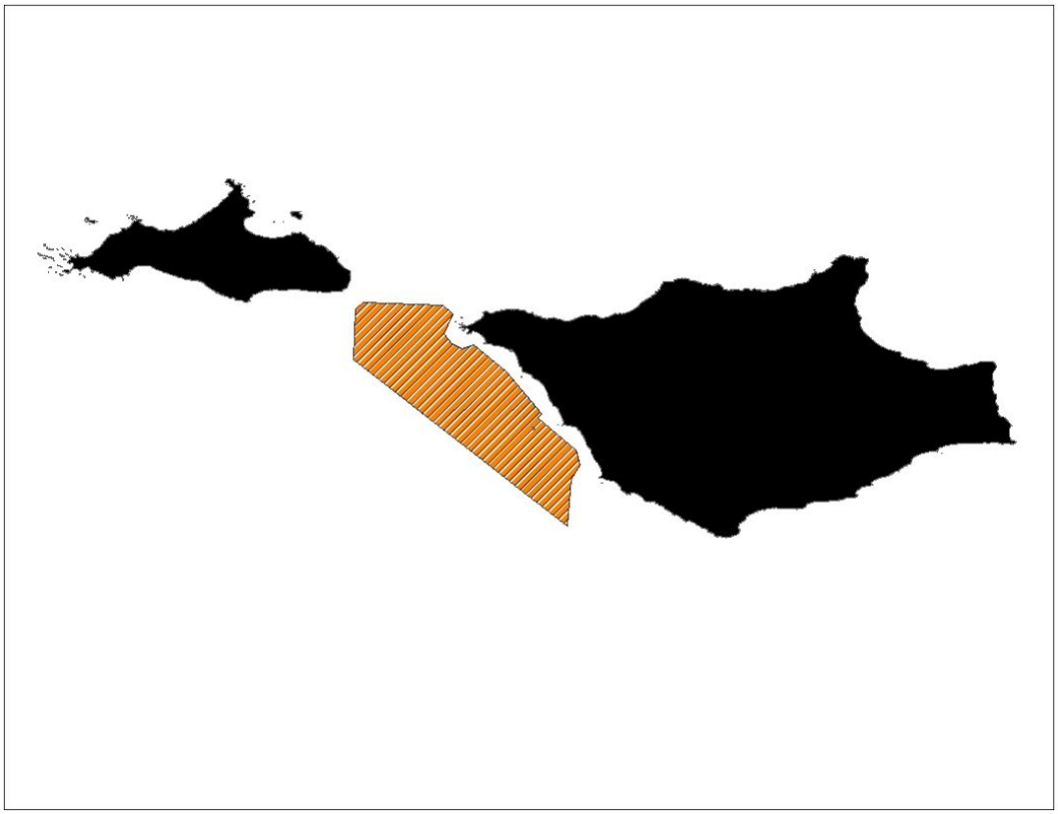
On 9/26/2018 8:05 AM, Meredith Payne - NOAA Federal wrote:

> Hi Ryan,

Further conversations between Guy (USGS) and CO Evans (RA) raised many concerns about the 2007 interferometric data west of Santa Rosa Island, and the high likelihood that the data quality (both bathymetric and backscatter) would not only be unacceptable for nautical charting needs, but also not meet needs of CINMS. These concerns were raised to HSD Operations Chief, Corey Allen, and those data quality issues, combined with a desire to not leave holes in RA's data acquisition plan, plus a favorable weather outlook in the survey region for next week, led to a decision to move forward with the original plan to begin mapping in Sheet 1, H13085. Corey left a message for Chris about this decision and asked me to let you know as well. Corey and I are available to chat further if you have concerns.
Sincerely,
Meredith

On Wed, Sep 19, 2018 at 6:37 PM Ryan Freedman - NOAA Affiliate <ryan.m.freedman@noaa.gov> wrote:

> Hey Rainer and OCS Crew,
>
> Guy Cochrane says he will release this polygon of bathymetry to the south of Santa Rosa Island. I am attaching a PDF and the shapefile for you guys incorporate. I am sorry for the last minute add but we would like to avoid re-mapping this area as it is now set to be released. Let me know if you need me to recut the survey areas or need any GIS assistance.
>
> Sorry for throwing a wrench in it,
>
> Ryan



Ryan M. Freedman
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Meredith C. Payne
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Visit our StoryMap!

--
CDR Ben Evans, NOAA
Commanding Officer
NOAA Ship RAINIER (S-221)

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Ship Rainier
2002 SE Marine Science Drive
Newport, OR 97365-5229

October 18, 2018

MEMORANDUM FOR: Meredith Payne
Project Manager OPR-L397-RA-18, Hydrographic Surveys Div.

FROM: Commander Benjamin Evans, NOAA
Commanding Officer, NOAA Ship *Rainier*

SUBJECT: Waiver Request – Features with Traditional Water Levels - Projects OPR-L397-RA-18

Rainier's shoreline feature processing workflow involves steps that require correcting feature heights using traditional water levels. Rainier is requesting a waiver to use traditional water level correctors for the following surveys within OPR-L397-RA-18:

H13085
H13086
H13087
H13205
H13201

Justification

A method for ellipsoidally referenced shoreline features acquired by traditional leveling methods is not available.

Decision

Waiver is:

_____ Granted _____ Denied

cc: Chief, HSD OPS; Ship OPS, Ship CHST

APPROVAL PAGE

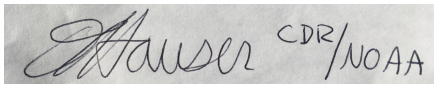
H13085

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 product

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