H12620

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12620

LOCALITY

State(s):	California
General Locality:	Long Beach, CA
Sub-locality:	Approaches to Long Beach

2013

CHIEF OF PARTY
CDR David J. Zezula, NOAA

LIBRARY & ARCHIVES

Date:

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

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H12620

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:	**Long Beach, CA**
Sub-Locality:	**Approaches to Long Beach**
Scale:	**10000**
Dates of Survey:	**11/02/2013 to 11/11/2013**
Instructions Dated:	**08/01/2013**
Project Number:	**OPR-L318-FA-13**
Field Unit:	**NOAA Ship *Fairweather***
Chief of Party:	**CDR David J. Zezula, NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Pacific Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12620

Project: OPR-L318-FA-13

Locality: Long Beach, CA

Sublocality: Approaches to Long Beach

Scale: 1:10000

November 2013 - November 2013

NOAA Ship *Fairweather*

Chief of Party: CDR David J. Zezula, NOAA

A. Area Surveyed

The survey area is located in Long Beach, CA, within the sub-locality of the Approaches to Long Beach.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
33° 43' 41.95" N 118° 6' 12.6" W	33° 35' 23.47" N 118° 0' 20.52" W

Table 1: Survey Limits

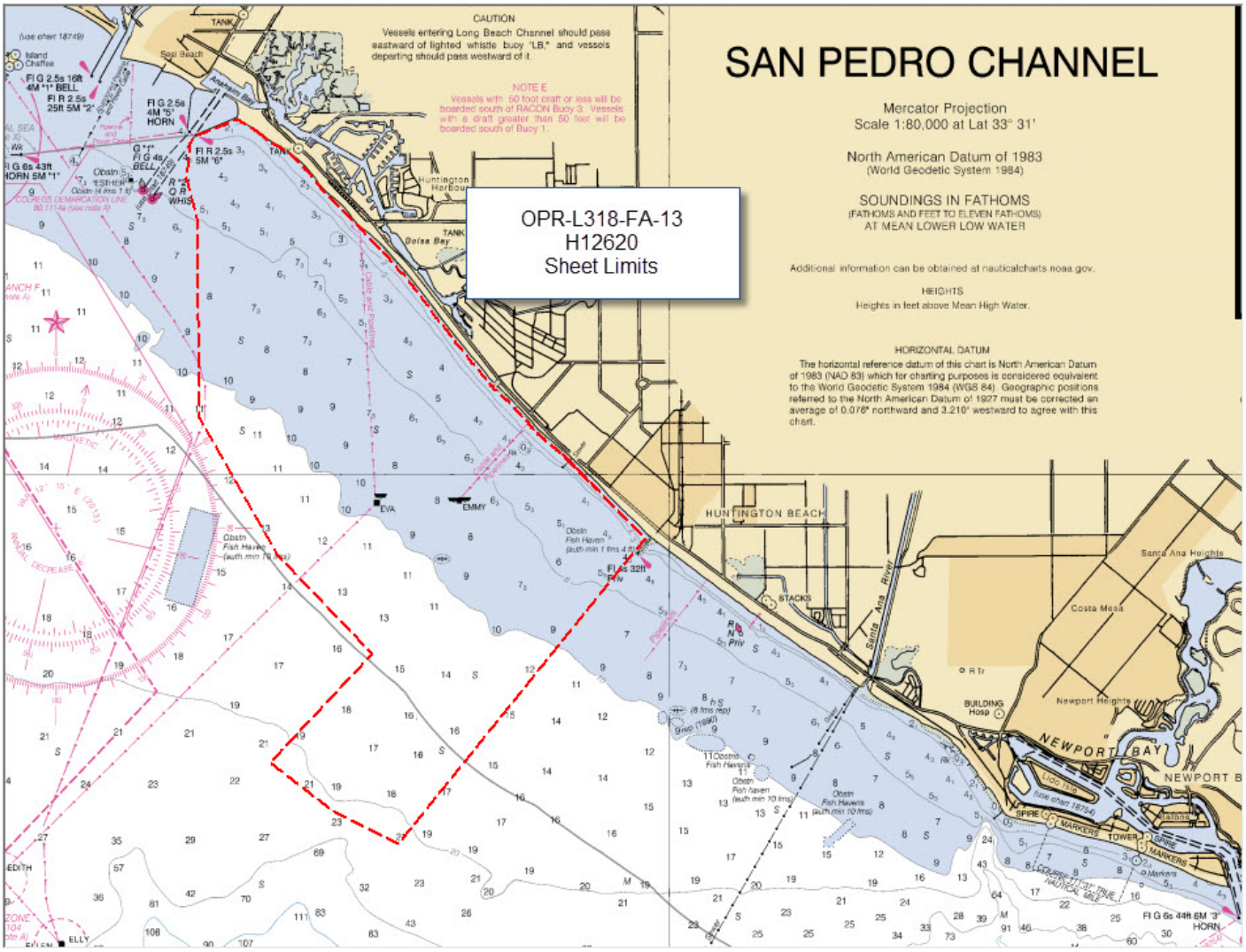


Figure 1: H12620 Sheet Limits

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

Survey limits were acquired in accordance with the modified sheet limits approved on Nov. 5 2013.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. The project will cover critical areas as identified in the 2012 NOAA Hydrographic Survey Priorities (NHSP).

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

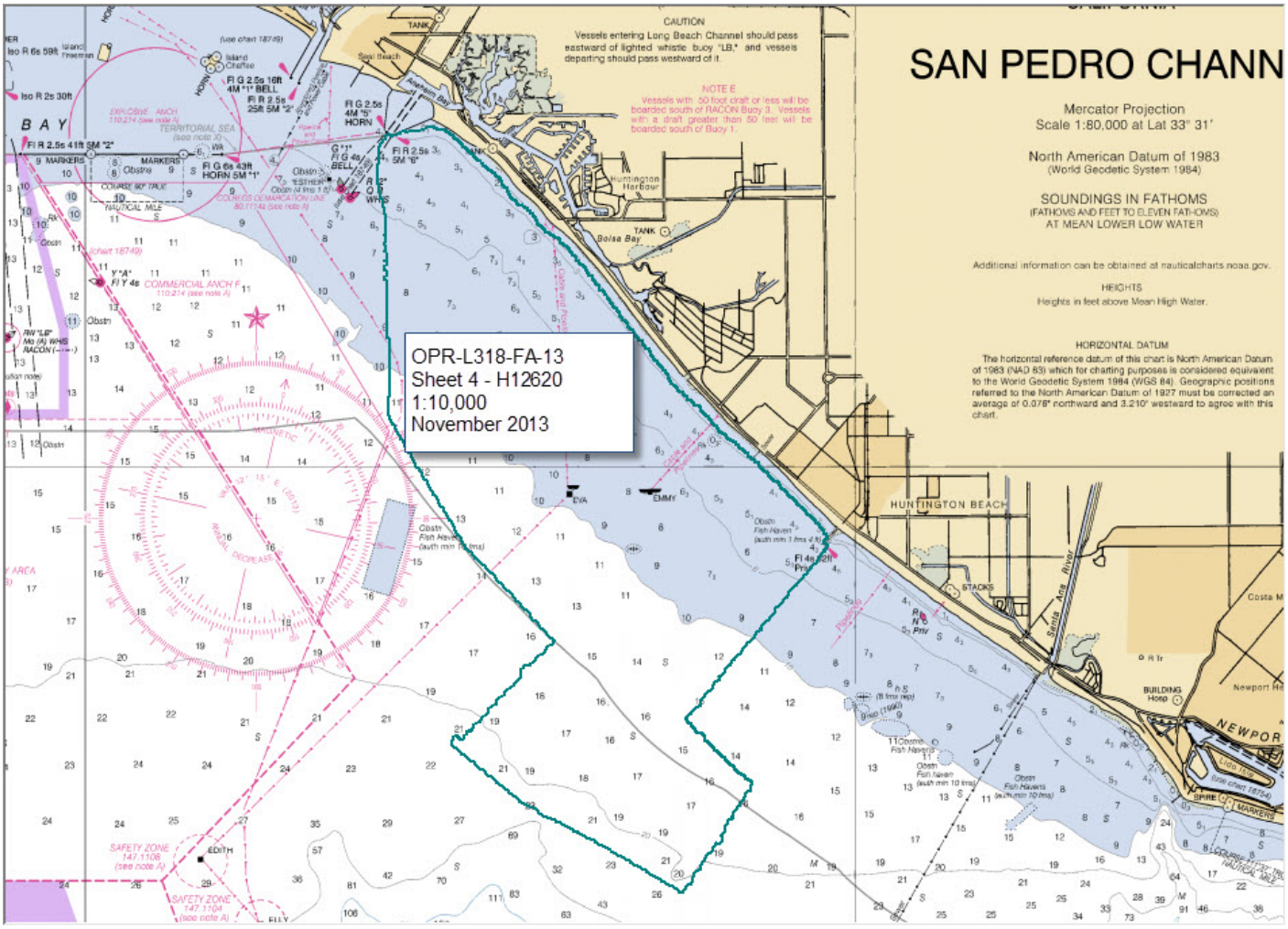


Figure 2: H12620 Survey Outline

During acquisition on Survey H12620, 25m line spacing was run perpendicular to the shore between the 4m and 8m curve. The 4m curve was not fully developed due to high surf near shore and an abundance of recreational use in the surf zone. The hydrographer believes that there was still enough data collected to fulfill the survey requirements. Full 25m line spacing was not reached in some areas as well, for the same reasons. The 4m curve along the East Jetty off of Anaheim Bay was not fully developed due to kelp and an abundance of crab pot buoys. Figure 3 shows the combined 4m CUBE with a 4-8m surface where soundings 4m and shoaler appear red and 8m-4m soundings appear tan.

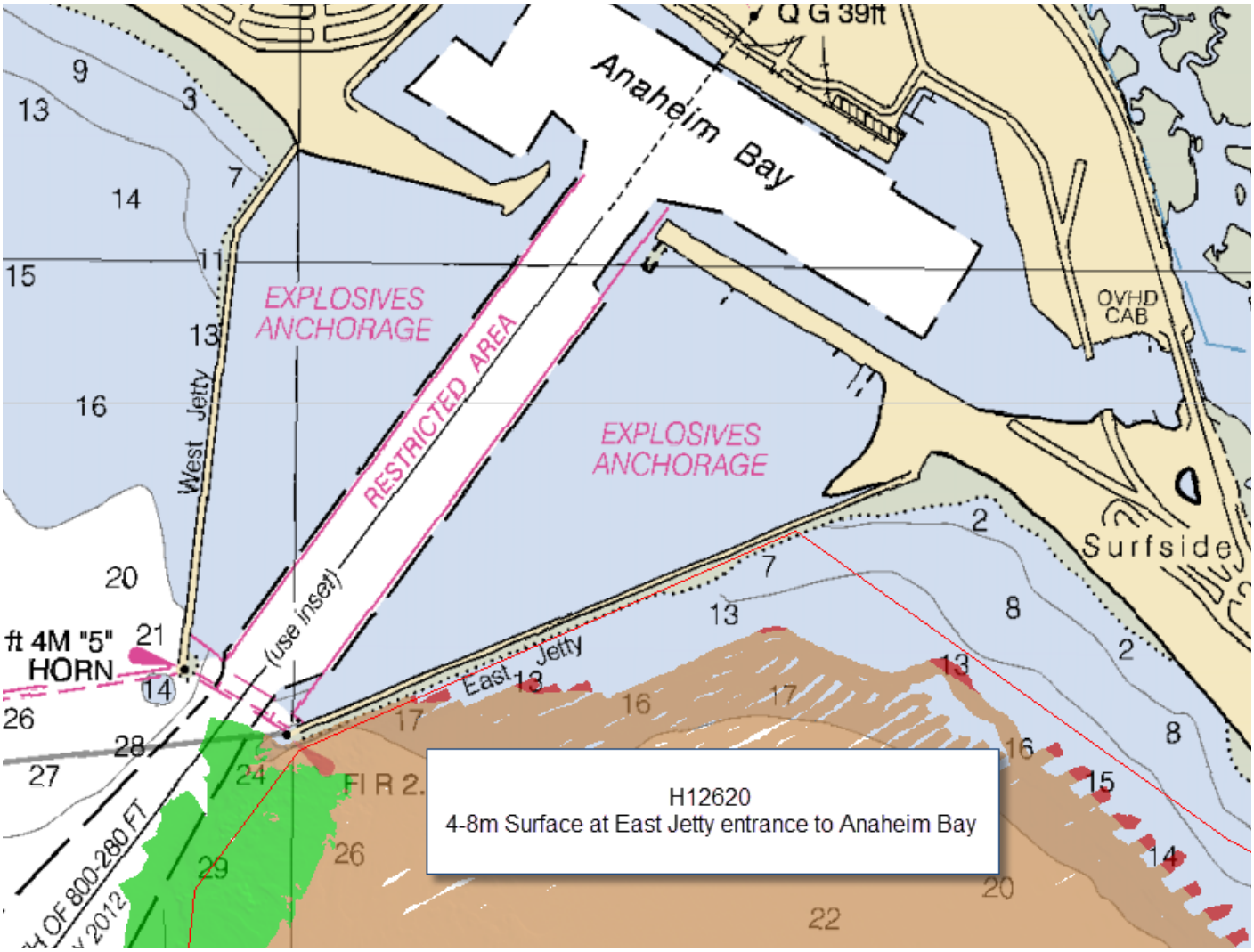


Figure 3: H12620 4-8m Surface along the East Jetty entrance to Anaheim Bay

A.5 Survey Statistics

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

	HULL ID	*2801*	*2805*	*2806*	*2807*	*Total*
LNM	SBES Mainscheme	0	0	0	0	0
	MBES Mainscheme	248.25	188.84	142.77	208.58	788.44
	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	6.57	5.99	39.98	0	52.54
	Lidar Crosslines	0	0	0	0	0
Number of Bottom Samples						0
Number of AWOIS Items Investigated						0
Number Maritime Boundary Points Investigated						0
Number of DPs						0
Number of Items Investigated by Dive Ops						0
Total SNM						20.3

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
11/02/2013	306
11/03/2013	307
11/04/2013	308
11/05/2013	309
11/06/2013	310
11/07/2013	311
11/08/2013	312
11/11/2013	315

Table 3: Dates of Hydrography

Re: Table 2--DPs were collected in the field, and are included in the Final Feature File.

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*	*2805*	*2806*	*2807*
LOA	8.64 meters	8.64 meters	8.64 meters	8.64 meters
Draft	1.12 meters	1.12 meters	1.12 meters	1.12 meters

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
RESON	7125	MBES
RESON	SVP71	Sound Speed System
Sea Bird	SBE 19Plus	Sound Speed System
Applanix	POS/MV V4	Positioning and Attitude System

Table 5: Major Systems Used

Sea-Bird SBE 19Plus is a Conductivity, Temperature, and Depth profiler.

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 7% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with 5.2.4.3 of the HSSD. Surface differencing in CARIS Bathy DataBASE was used to assess crossline agreement with main-scheme lines. Figure 4 depicts a difference surface between a 4-meter surface made with main-scheme lines only and a 4-meter surface made with crosslines only. This difference surface is submitted digitally in the Separates II folder.

Crossline and main-scheme differences (gray indicates agreement, cool colors indicate crosslines shoaler than main-scheme and warm colors indicate where crosslines are deeper)

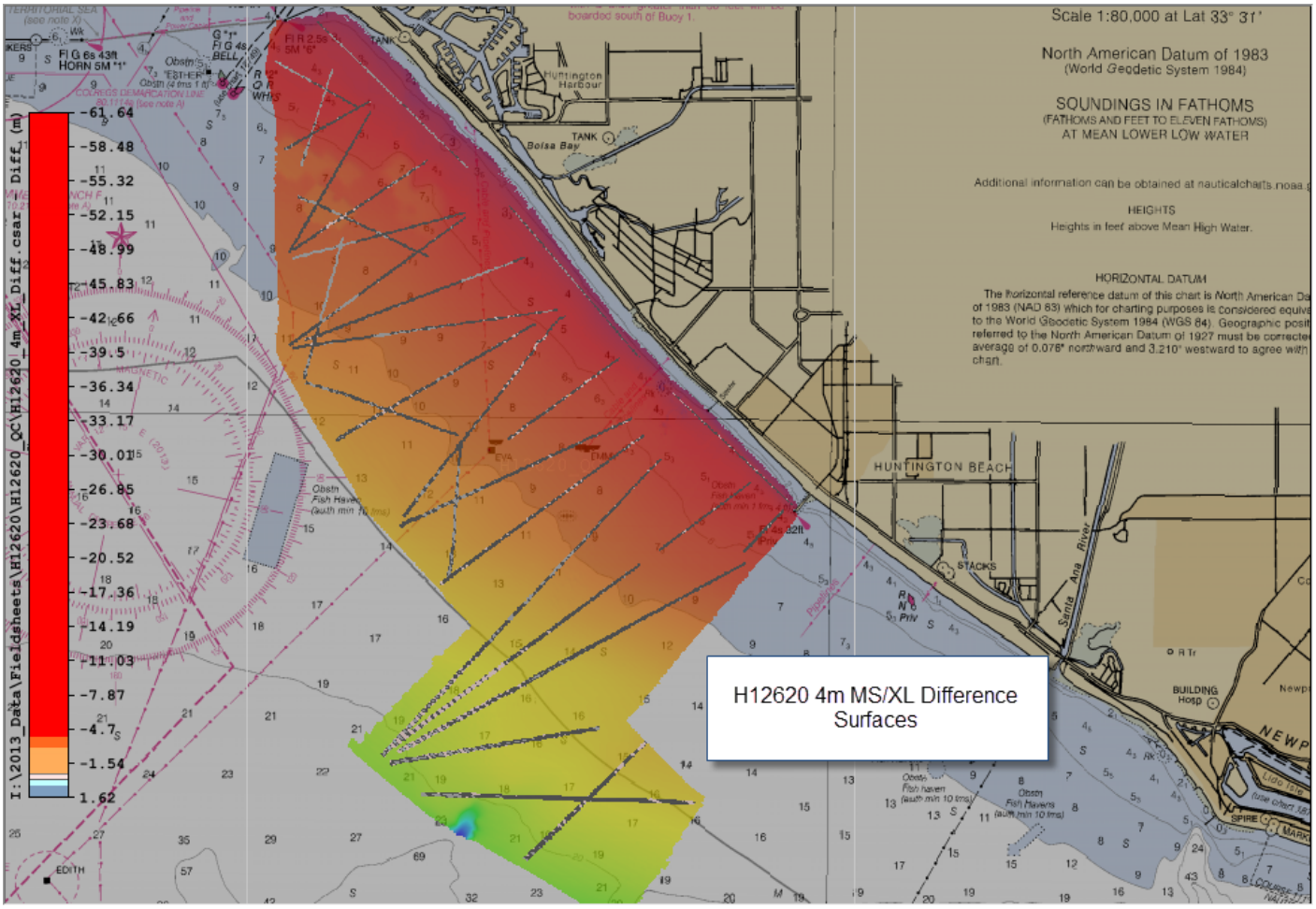


Figure 4: Crossline and main-scheme differences (gray indicates agreement, cool colors indicate crosslines shoaler than main-scheme and warm colors indicate crosslines are deeper)

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.01 meters	0.08 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
2801	2 meters/second		0.5 meters/second
2805	2 meters/second		0.5 meters/second
2806	2 meters/second		0.5 meters/second
2807	2 meters/second		0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

B.2.3 Junctions

The areas of overlap between the sheets were reviewed in CARIS Subset Editor for sounding consistency and by surface differencing 2 meter combined surfaces to assess surface agreement. The junction agreement is generally within the total allowable vertical uncertainty in their common areas and depths for all surfaces. Data overlap between all surveys was achieved. See figure 5 for planned areas of overlap.

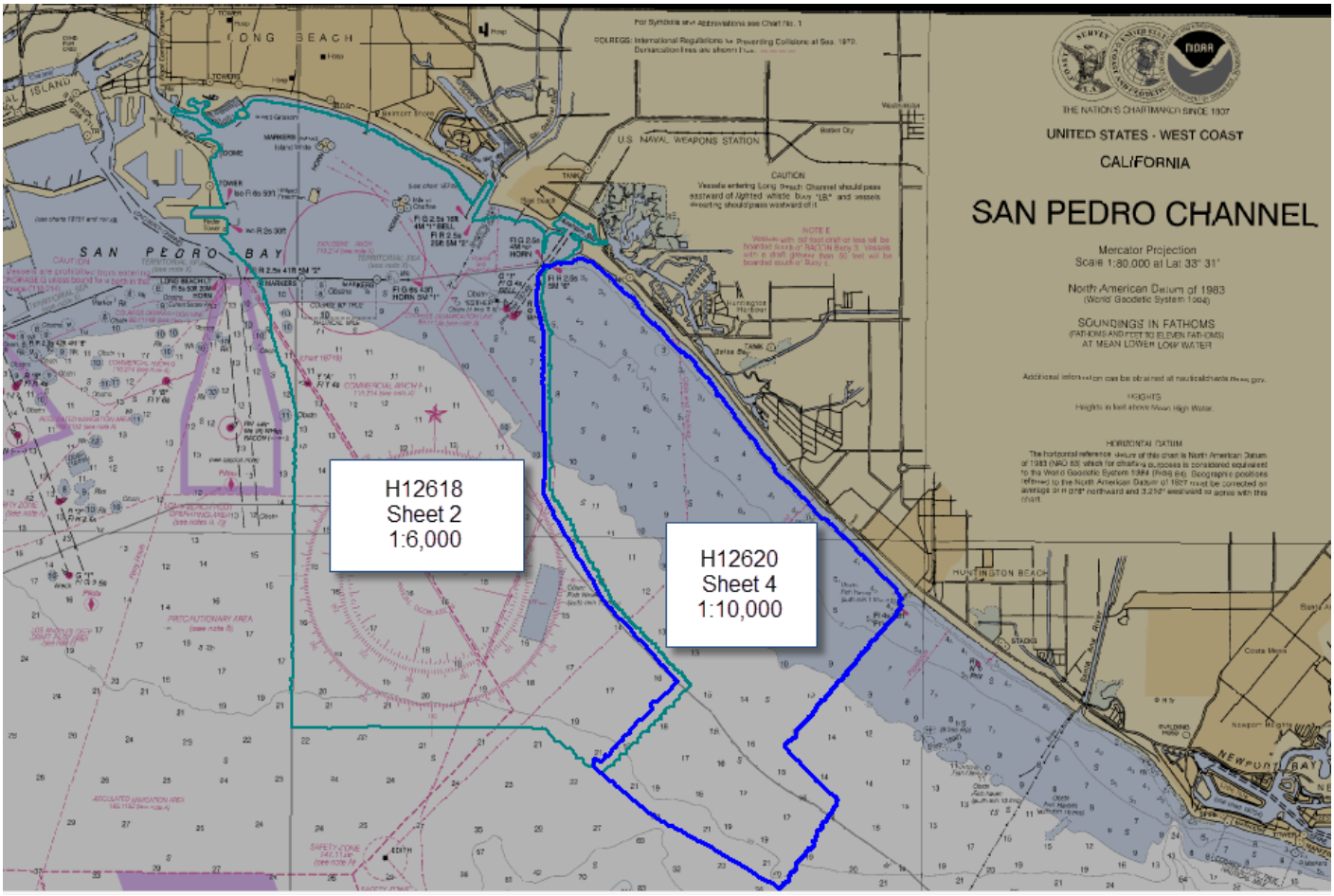


Figure 5: Junctions between H12618 and H12620

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12618	1:6000	2013	NOAA Ship FAIRWEATHER	NW

Table 8: Junctioning Surveys

H12618

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between H12618_MB_2m_MLLW_Combined surface and H12620_MB_2m_MLLW_Combined. The difference between surfaces were generally less than 0.5m and the few areas of larger differences are believed to be

caused by rapid changes in slope. See Figure 6 for a graphical representation and figure 7 for statistical information of the surface differencing.

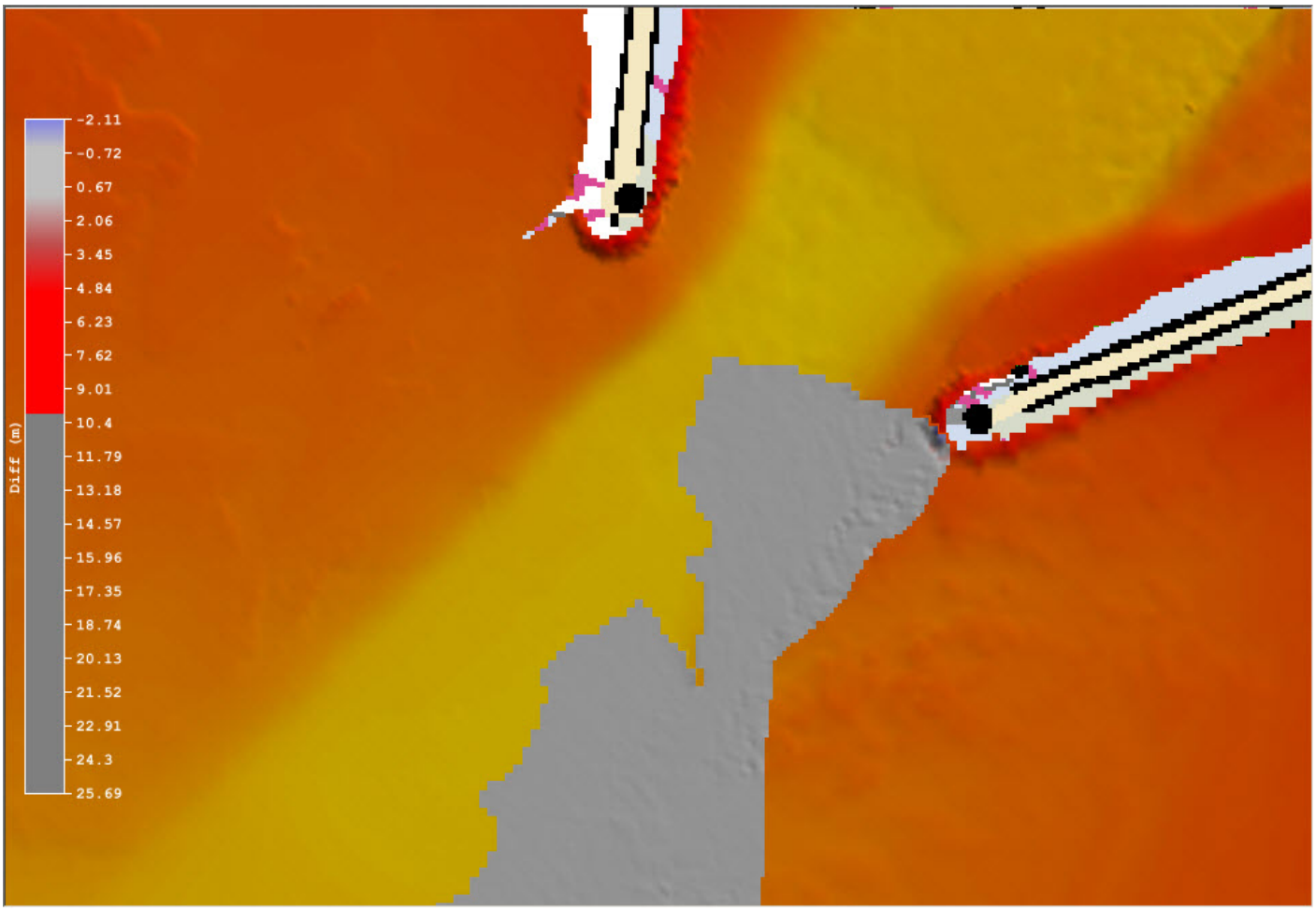
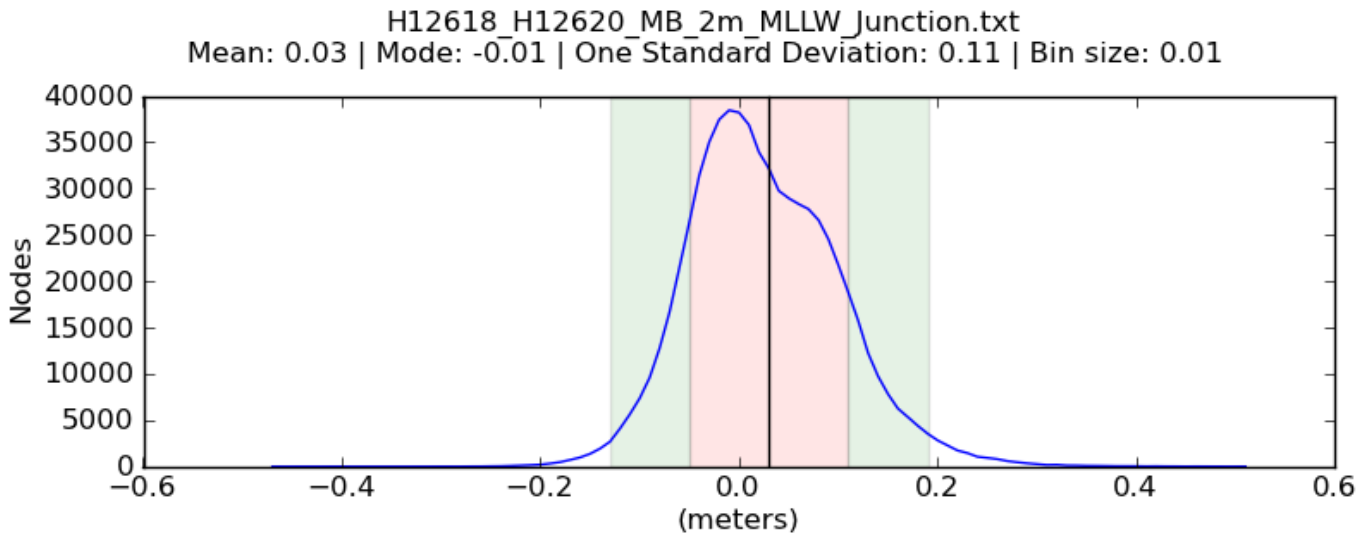
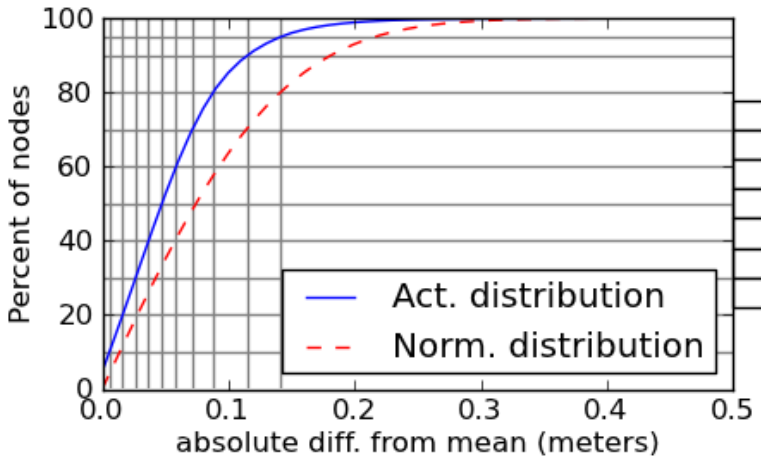


Figure 6: Graphical representation of differences between junction H12618 and H12620.





Percent of nodes	Deviation (m)
50%	+/- 0.05
60%	+/- 0.06
70%	+/- 0.07
80%	+/- 0.09
90%	+/- 0.12
95%	+/- 0.14

Figure 7: Statistical information for junction comparison between sheet H12618 and H12620.

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

Hypack Data Gaps

During acquisition, data gaps occurred in the HYPACK/HYSWEEP software that lead to holidays in the raw data. Figure 8 shows examples of these data gaps.

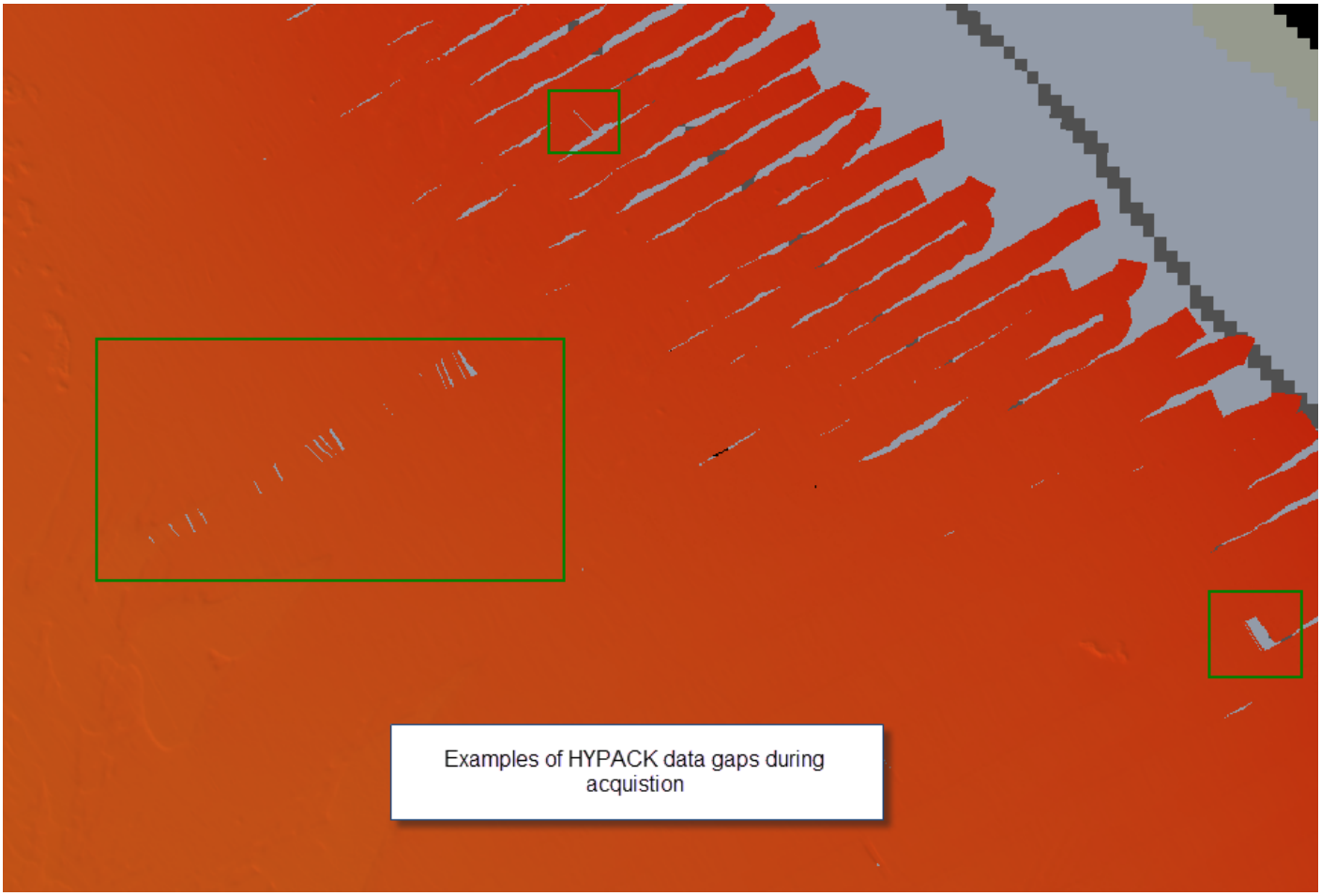


Figure 8: Example of HYPACK/HYSWEEP data gaps.

B.2.6 Factors Affecting Soundings

Surface Sound Speed Sensor

Due to adverse sea conditions in the survey area during acquisition, the launches experienced "pounding" or hard pitching when surveying into heavy seas or swells. This caused the surface sound velocimeter to make erroneous measurements causing periods of extreme refraction and profile bending. These errors occurred throughout H12620. An example of these errors, and the subsequent holidays that resulted can be seen at 33/40/31.23N 118/03/28.46W and are illustrated in Figures 9 and 10. The spikes caused by these errors were cleaned out and the profiles were rejected with interpolation.

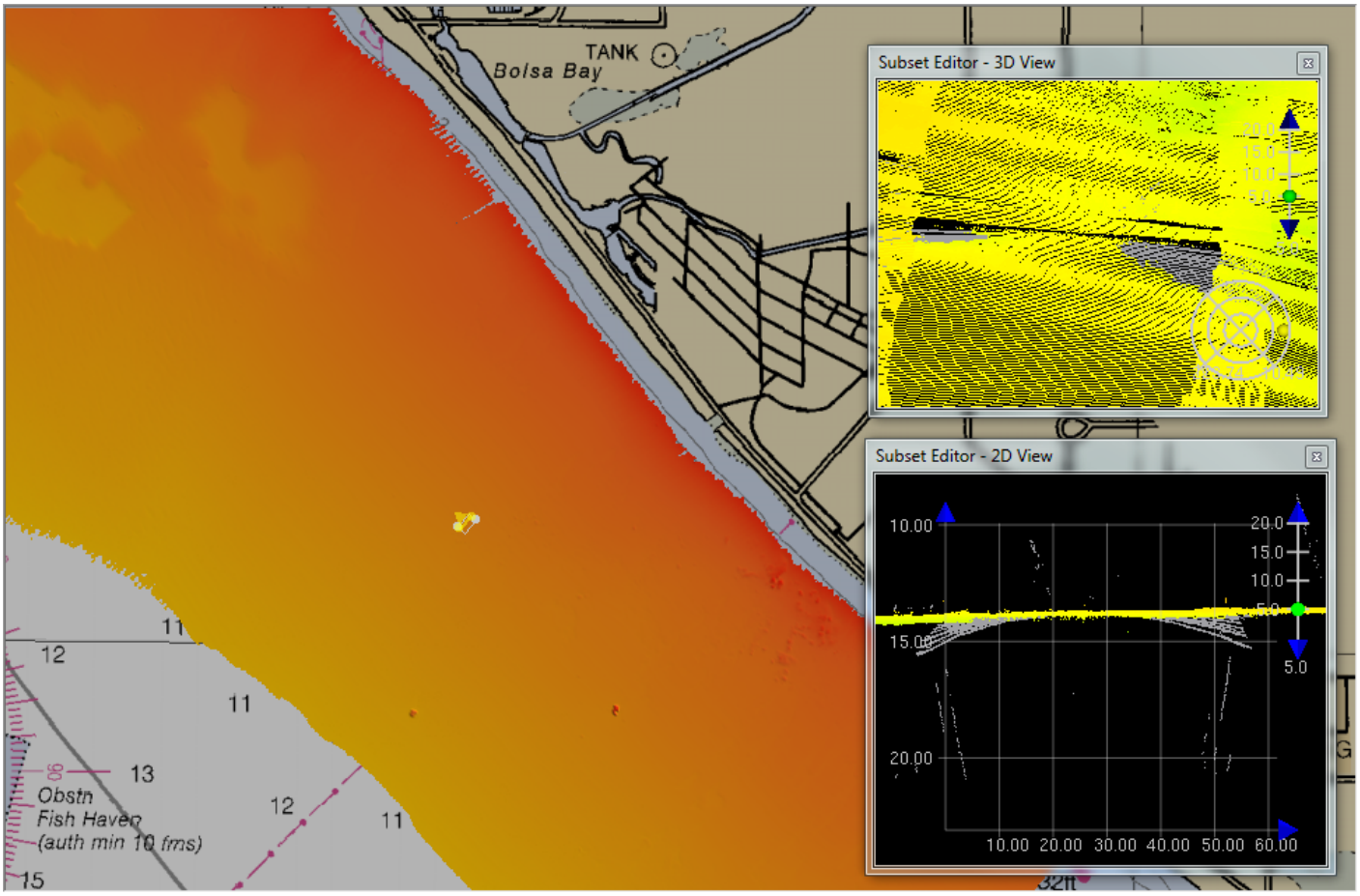


Figure 9: Example of bent profiles due to erroneous SSP measurements.

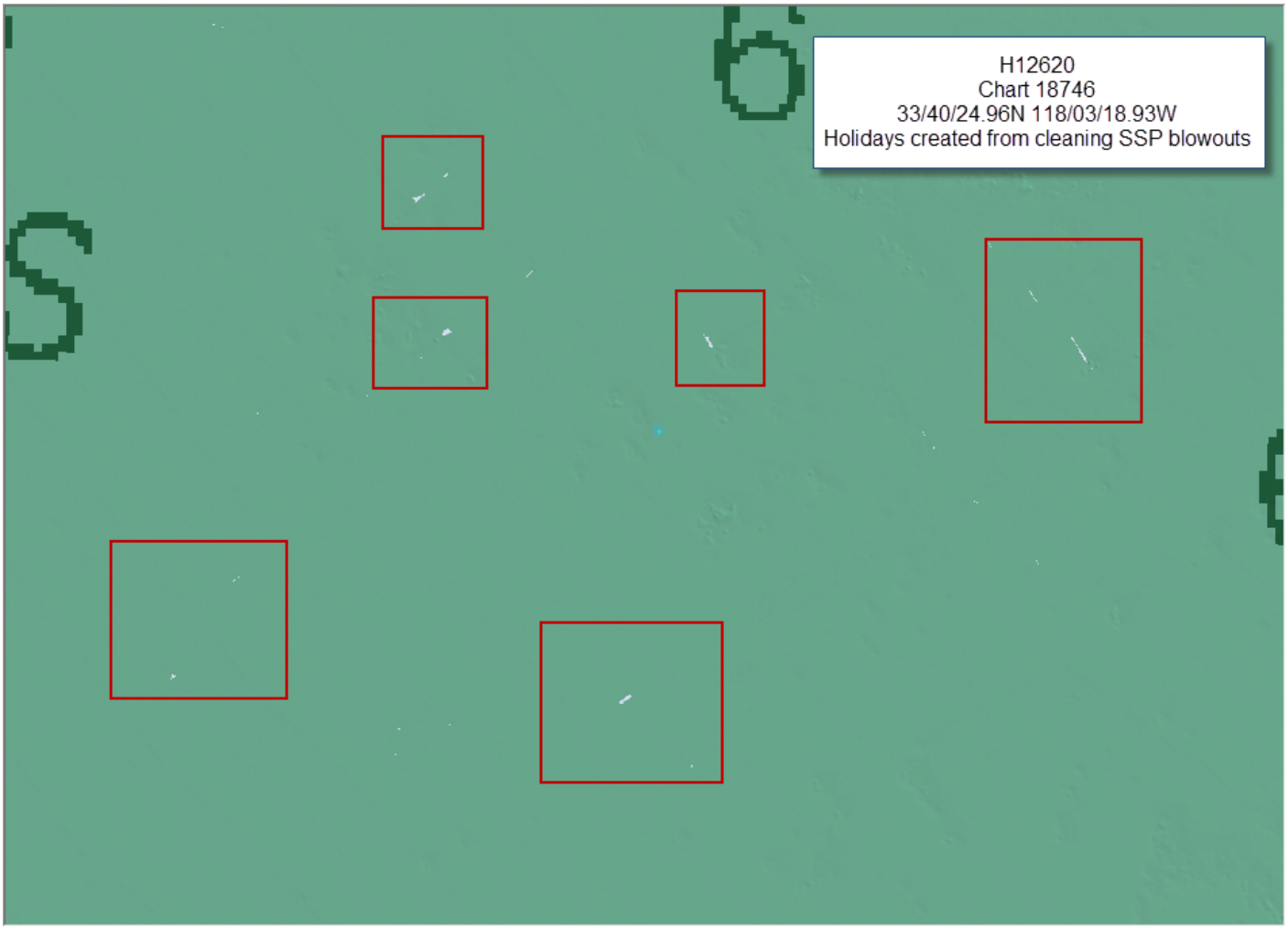


Figure 10: Holidays created from cleaning SSP blowouts.

Kelp

A kelp infested area SE of the entrance to Anaheim Bay at 33/42/15.6N 118/05/11.5W (Fig. 11) is present on rocky outcroppings. The area was cleaned to the substrate to the best of the Hydrographer's ability.

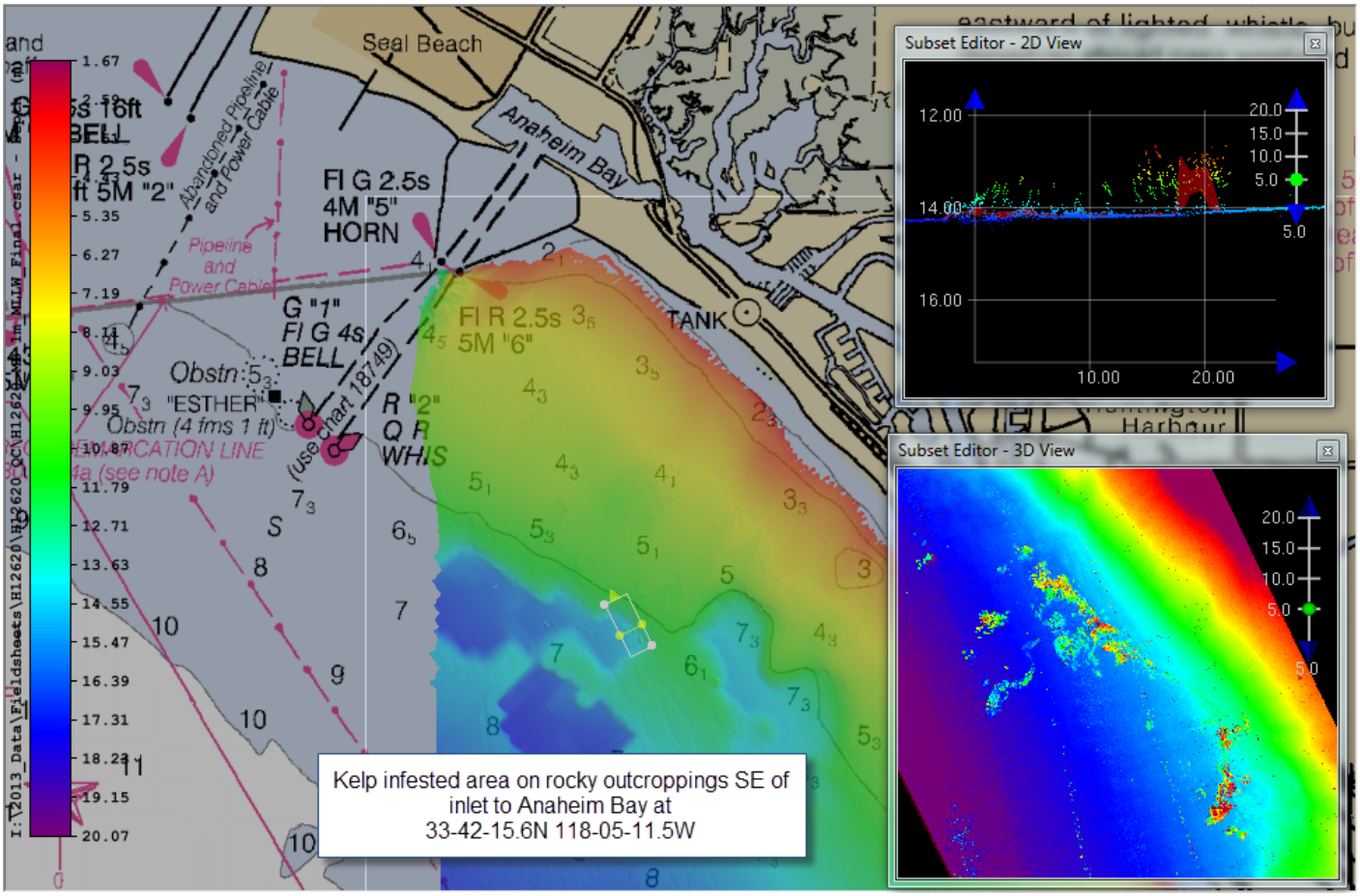


Figure 11: Kelp area

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed measurements were conducted as discussed in the Data Acquisition section of the DAPR.

B.2.8 Coverage Equipment and Methods

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

B.2.9 Holiday Assesment

Complete multibeam coverage was obtained within the limits of H12620. For holidays larger than three surface grid nodes, the corresponding multibeam side scan was examined and no navigationally significant items were found. The least depths of all navigationally significant features are represented by H12620 bathymetry. Holidays resulting from HYPACK/HYSWEEP data gaps are referenced above in Figure 8. Figure 10 under Surface Sound Speed sensor shows an example of holidays created by cleaning out

erroneous Surface Sound Speed measurements. The holiday located at the entrance to Anaheim Bay has the least depth represented and is shown in Figure 12. Figure 13 shows the holidays resulting from the cleaning out of pilings that are part of Platform EMMY (chart 18746).

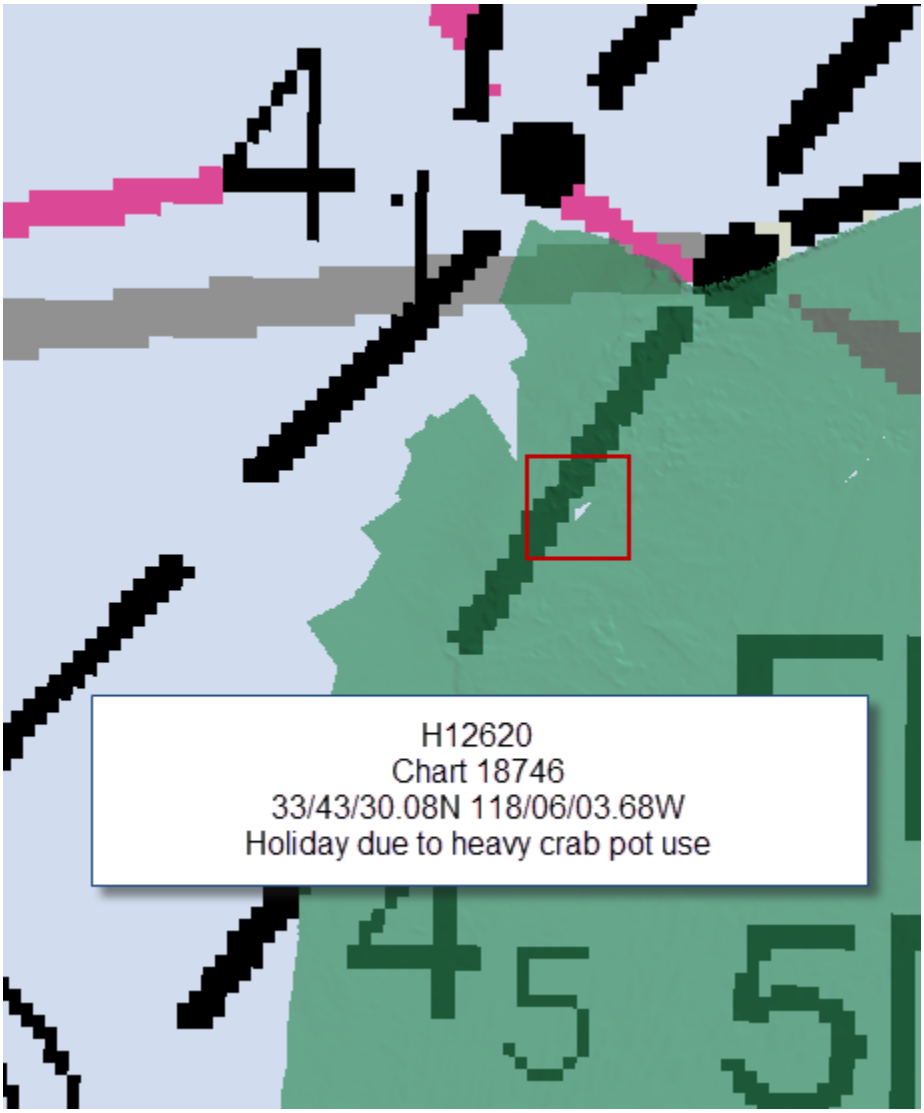


Figure 12: H12620 Holiday due to heavy crab pots in the area of Anaheim Bay.

Figure 13: H12620 Holidays due to cleaning of Platform EMMY (chart 18746) from the HIPS Surface.

B.2.10 IHO Uncertainty

All data meet the data accuracy specifications as stated in the NOS Hydrographic Surveys Specifications and Deliverables (HSSD) dated April 2013. See Standards Compliance Review in Appendix V.

The Standards Compliance Review document is included in Appendix II.

B.2.11 Density

Density requirements for H12620 were achieved with at least 99% of finalized surface nodes containing five or more soundings, see Standards Compliance Review in Appendix V.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

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

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAA Profile V_5_3

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
H12620_MB_1m_MLLW	CUBE	1 meters	-	NOAA_1m	Complete MBES
H12620_MB_2m_MLLW	CUBE	2 meters	-	NOAA_2m	Complete MBES
H12620_MB_4m_MLLW	CUBE	4 meters	-	NOAA_4m	Complete MBES
H12620_MB_1m_MLLW_Final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12620_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12620_MB_4m_MLLW_Final	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Complete MBES
H12620_MB_4m_MLLW_Combined	CUBE	4 meters	0 meters - 80 meters	NOAA_4m	Complete MBES

Table 9: Submitted Surfaces

The NOAA CUBE parameters mandated in the HSSD were used for the creation of all CUBE BASE surfaces in Survey H12620. 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 be shoaler or deeper than the reliably measured seabed by greater than the maximum allowable Total Vertical Uncertainty at that depth, the noisy data have been rejected and the surface recomputed.

The combined surface "H12620_MB_4m_MLLW_Combined" was not submitted to the Processing Branch.

B.5.3 Data Logs

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final tide and sound velocity application is noted in the H12620 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Critical Soundings

Designation of soundings followed procedures as outlined in section 5.2.1.2 of the HSSD. Survey H12620 requires 42 designated soundings to accurately represent the seafloor.

Six additional soundings were designated during office review.

B.5.5 Data Processing Deviations

While all Cross-lines were filtered to 45 degrees off nadir on both port and starboard, some data were re-accepted to fill gaps created by filtering.

C. Vertical and Horizontal Control

No additional Horizontal or Vertical Control Report will be submitted with H12620.

C.1 Vertical Control

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

Standard Vertical Control Methods Used:

Discrete Zoning

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

Station Name	Station ID
Los Angeles, CA	9410660
Port San Luis, CA	9412110

Table 10: NWLON Tide Stations

File Name	Status
9410660.tid	Final Approved

Table 11: Water Level Files (.tid)

File Name	Status
L318FA2013CORP_Rev.zdf	Final

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

A request for final approved tides was sent to N/OPS1 on 11/12/2013. The final tide note was received on 11/19/2013.

Preliminary zoning is accepted as the final zoning for project OPR-L318-FA-2013.

Tide station 9412110 (Port San Luis, CA) was not used for datum control for this survey.
Tide Note is appended to this report.

C.2 Horizontal Control

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

The projection used for this project is UTM Zone 11 North.

The following PPK methods were used for horizontal control:

Smart Base

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

2805 2013M_3091915-2314 (SBET times are outside line times);

2801 2013X_3122156, 2013M_3112033 (SBET times are outside line times).

For further details regarding the processing and quality control checks performed see the H12620 POSPAC Processing Logs spreadsheet located in the SBET folder with the GNSS data. See also the OPR_L318-FA-13 Horizontal and Vertical Control report, submitted under separate cover.

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
BLSA	Bolsa Chica Channel
CAT2	CAT2_SCGN_CS2000
CAT3	CAT3_SCGN_CS2008
CCCS	Carbon Creek Control Structure
CRHS	CRHS_SCGN_CS1999
FVPK	Fairview Park
LBC2	Long Beach CC 2
P471	SanJuanCrkCS2005
PVE3	Palos Verdes
PVHS	Peninsula High School
PVRS	PVRS_SCGN_CS1998
SACY	Santa Ana Corp. Yard
SBCC	SBCC_SCGN_CS1999
TRAK	BOOMER CANYON
VTIS	Marine Exchange

Table 13: CORS Base Stations

Survey lines 2013M_3091915 through 3092314 are from vessel 2807 (and not 2805). Survey line 2801 2013M3112033 contained only 0.3 seconds of data and was deleted from the data set during office review.

Differential correctors from the U.S Coast Guard beacons at Bakersfield (305 kHz) or Point Loma (302 kHz) were used during real-time acquisition as noted in the acquisition logs.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Bakersfield (305kHz)
Point Loma (302kHz)

Table 14: USCG DGPS Stations

C.3 Additional Horizontal or Vertical Control Issues

3.3.1 POSPac Error Values

Roll, pitch, gyro, and navigation (and elevation) uncertainty values were supplied by an SBET RMS file generated by Applanix POSPac.

D. Results and Recommendations

D.1 Chart Comparison

A visual comparison of soundings and contours was conducted between the digital surfaces generated from the survey data and both raster charts for the area.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
18746	1:80000	39	06/2013	08/13/2013	08/24/2013
18749	1:20000	43	04/2010	08/13/2013	08/24/2013

Table 15: Largest Scale Raster Charts

18746

Soundings from survey H12620 generally agree within one to two fathoms of the charted depth. Contours generally agree with the chart except near the SW corner of the survey as noted in Figure 14 and West of Bolsa Bay as noted in Figure 15.

Figure 14: Disagreement between charted contours (18746) and surveyed soundings SW of Huntington Beach.

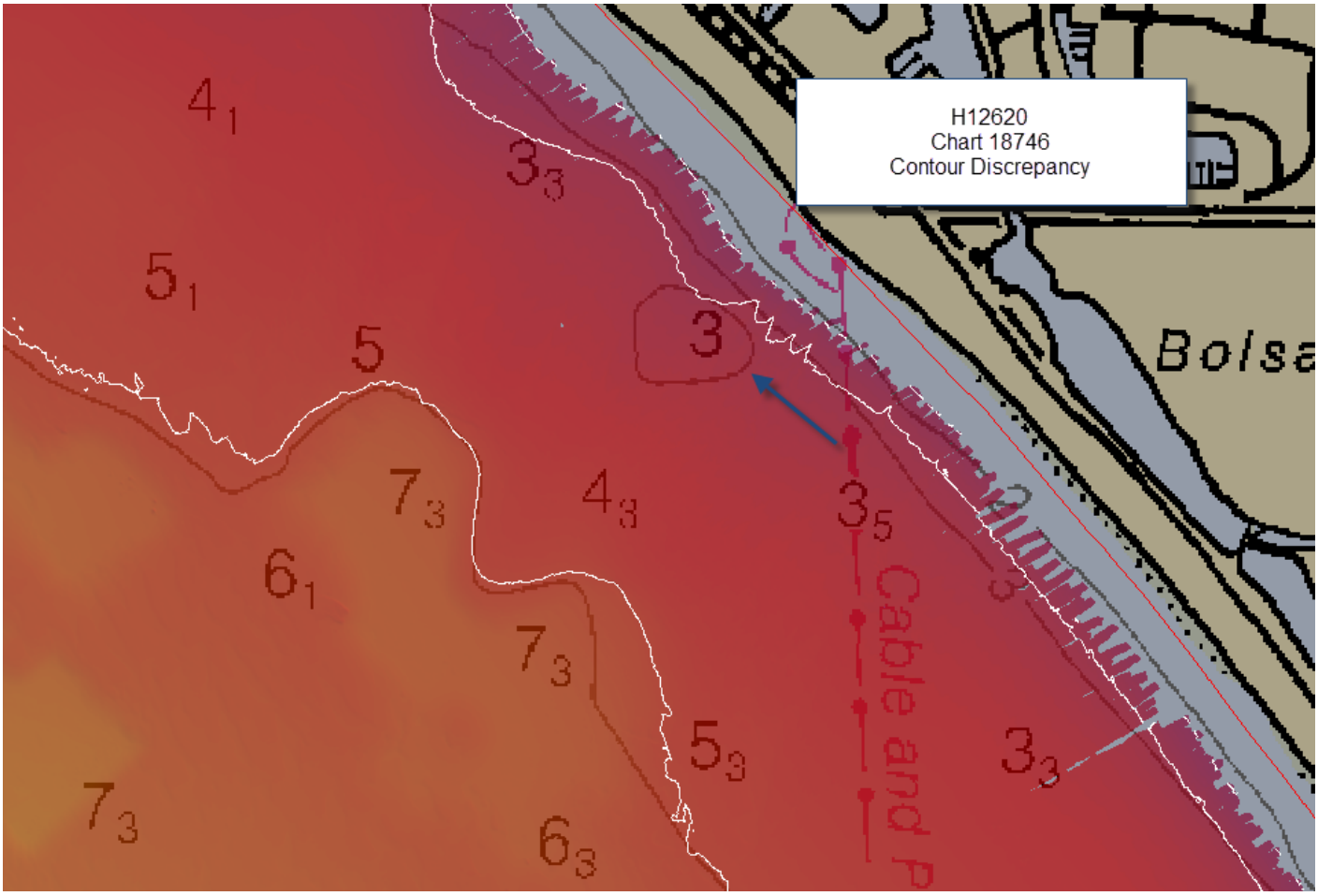


Figure 15: Disagreement between charted contours (18746) and surveyed soundings West of Bolsa Bay. Charted 3fm contour no longer present.

18749

Soundings from survey H12620 generally agree within one to two feet of the charted depth. Contours generally agree with the chart except SE of Sunset Beach as noted below in Figure 16.

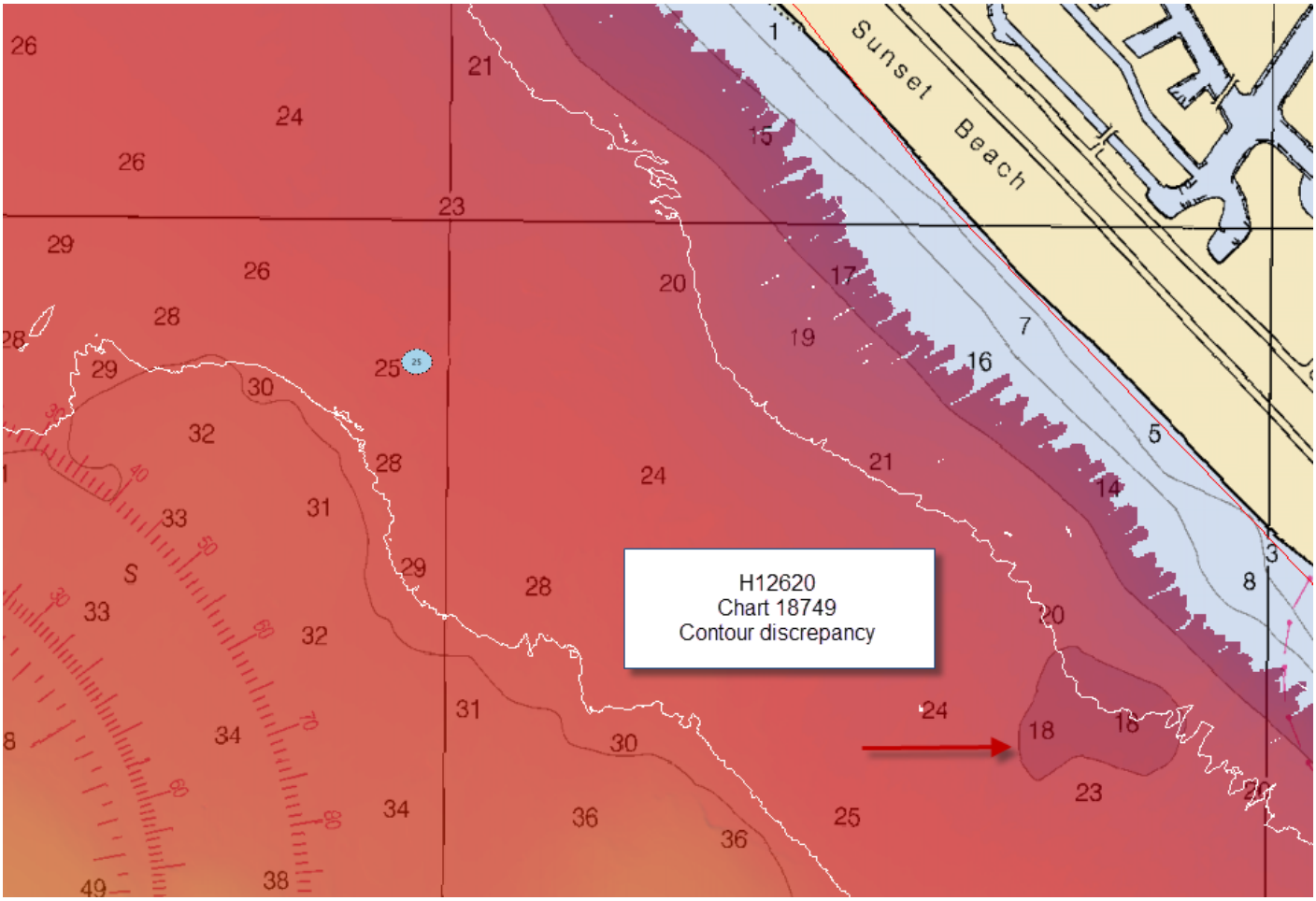


Figure 16: H12620 Chart 18749 Contour discrepancy.
Charted 20ft contour no longer present SE of Sunset Beach.

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4CA60M	1:80000	16	05/28/2013	08/09/2013	NO
US5CA61M	1:20000	30	05/13/2011	07/12/2013	NO

Table 16: Largest Scale ENCs

US4CA60M

See discussion from Raster chart 18746 for more details.

US5CA61M

See discussion from Raster chart 18749 for more details.

D.1.3 AWOIS Items

No AWOIS items were assigned for this survey.

One AWOIS item (#53262) was assigned to the survey and the corresponding feature was found and corrected by the field unit. See the attached Features Report for specific details.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

All assigned charted features were investigated and are included in the survey Final Feature File.

D.1.6 Uncharted Features

Survey H12620 has two previously uncharted wrecks. The wreck West of Sunset Beach at 33/42/51.4N 118/05/02.33W is approximately 4m long and 1m high with a least depth of 7.6m (25ft) as shown in Figure 17. The wreck South of platform Emmy on chart 18746 at 33/38.50N 118/02/15.48W is approximately 17.5m long and 1.8m high with a least depth of 14.64m as shown in Figure 18. Figure 19 shows an area at the entrance to Anaheim Bay that was inundated with crab pots. A holiday resulting from this is shown in Figure 12 under Additional Quality Control: Holiday Assessment.

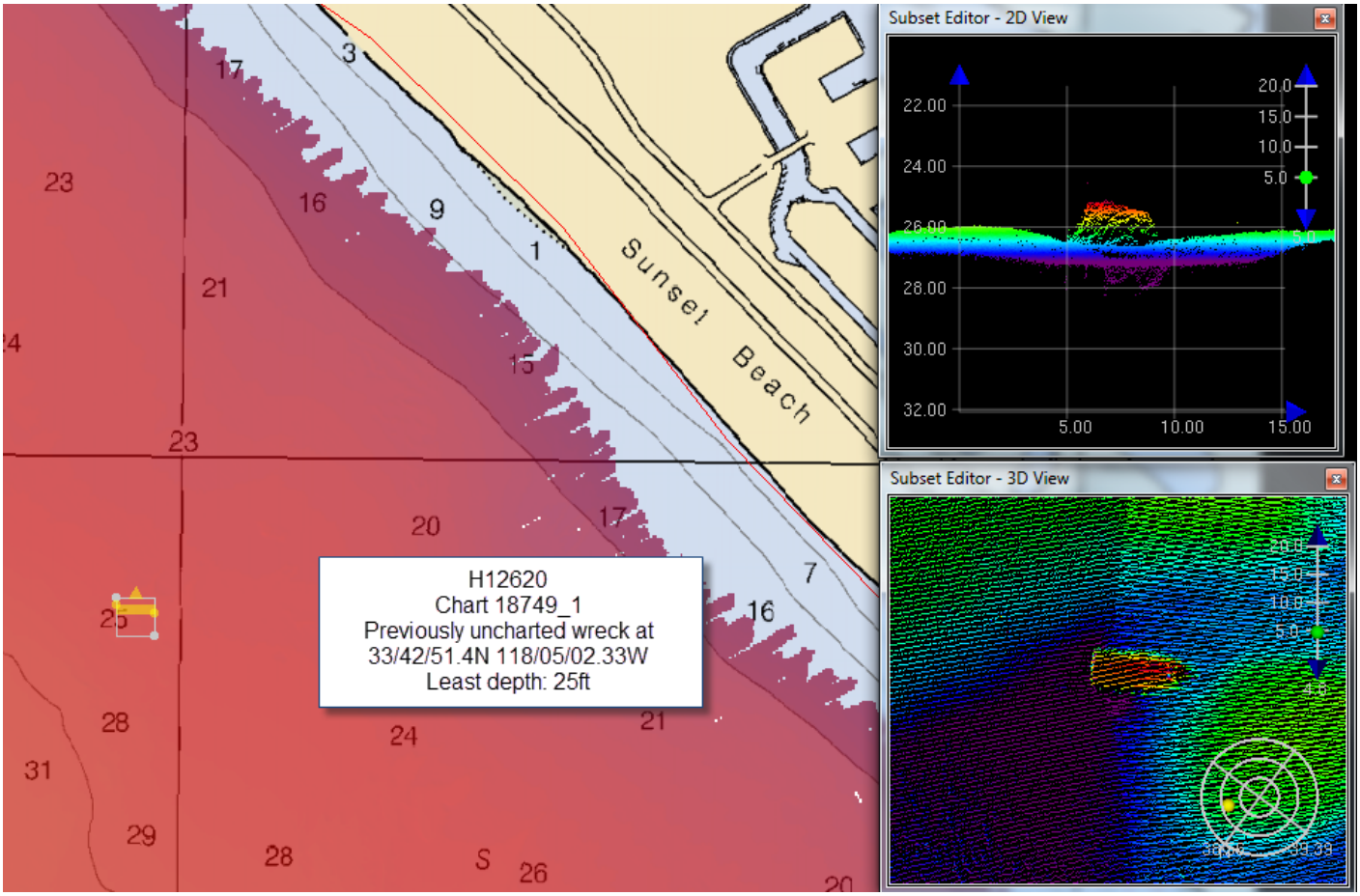


Figure 17: H12620 Previously uncharted wreck West of Sunset Beach on chart 18749

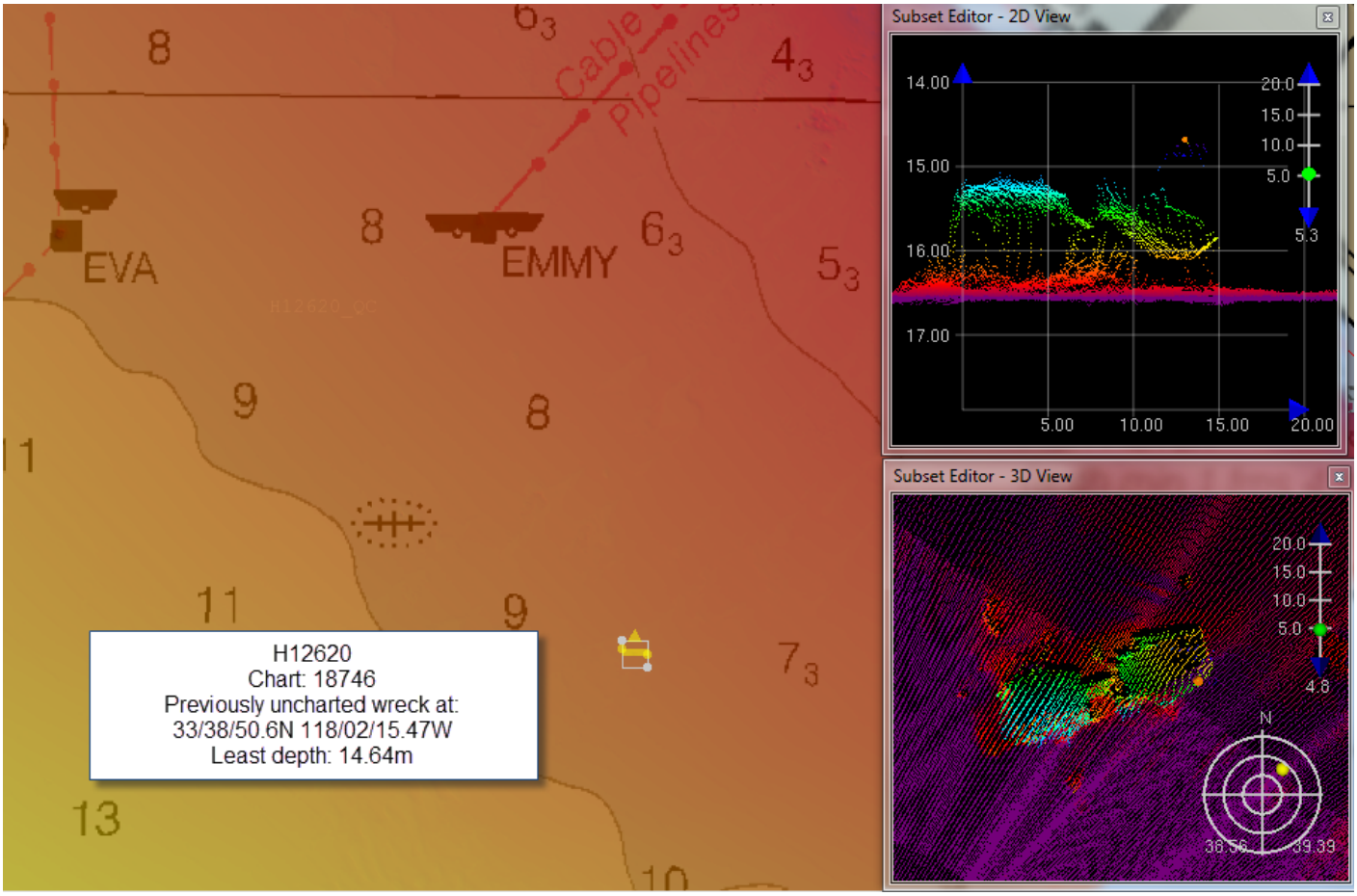


Figure 18: H12620 Previously uncharted wreck South of platform Emmy on chart 18746

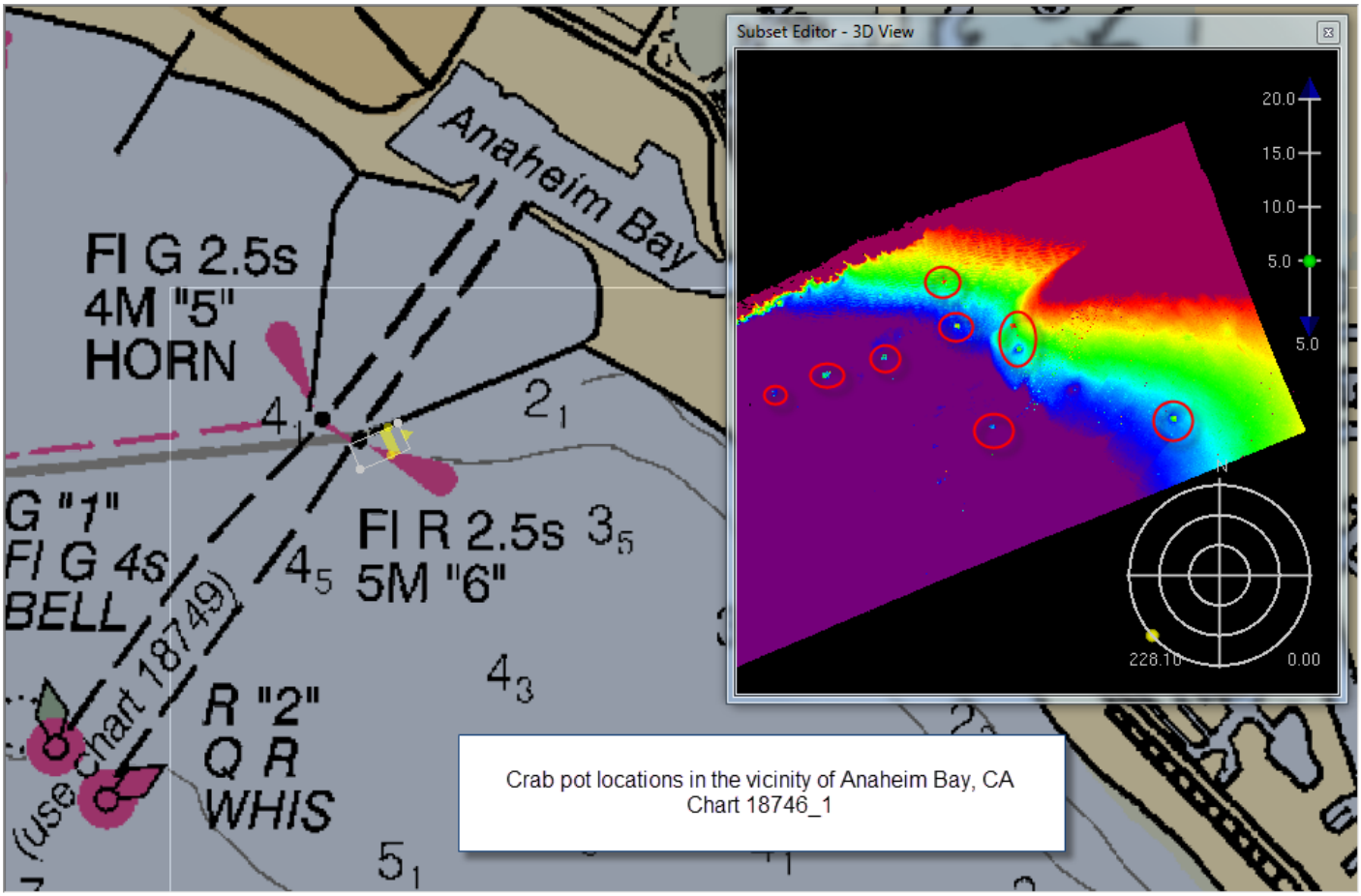


Figure 19: H12620 Chart 18746 heavy crab pot use at entrance to Anaheim Bay

Five new rocks and seven new obstructions were found during office processing at the branch and were included in the Final Feature file.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

Survey H12620 includes one hazardous feature. A charted rock northeast of platform Emmy on chart 18746 has a new least depth of 2.3m and has a new position as shown in Figures 20 and 21. Recommendations are included in the Final Feature File for H12620.

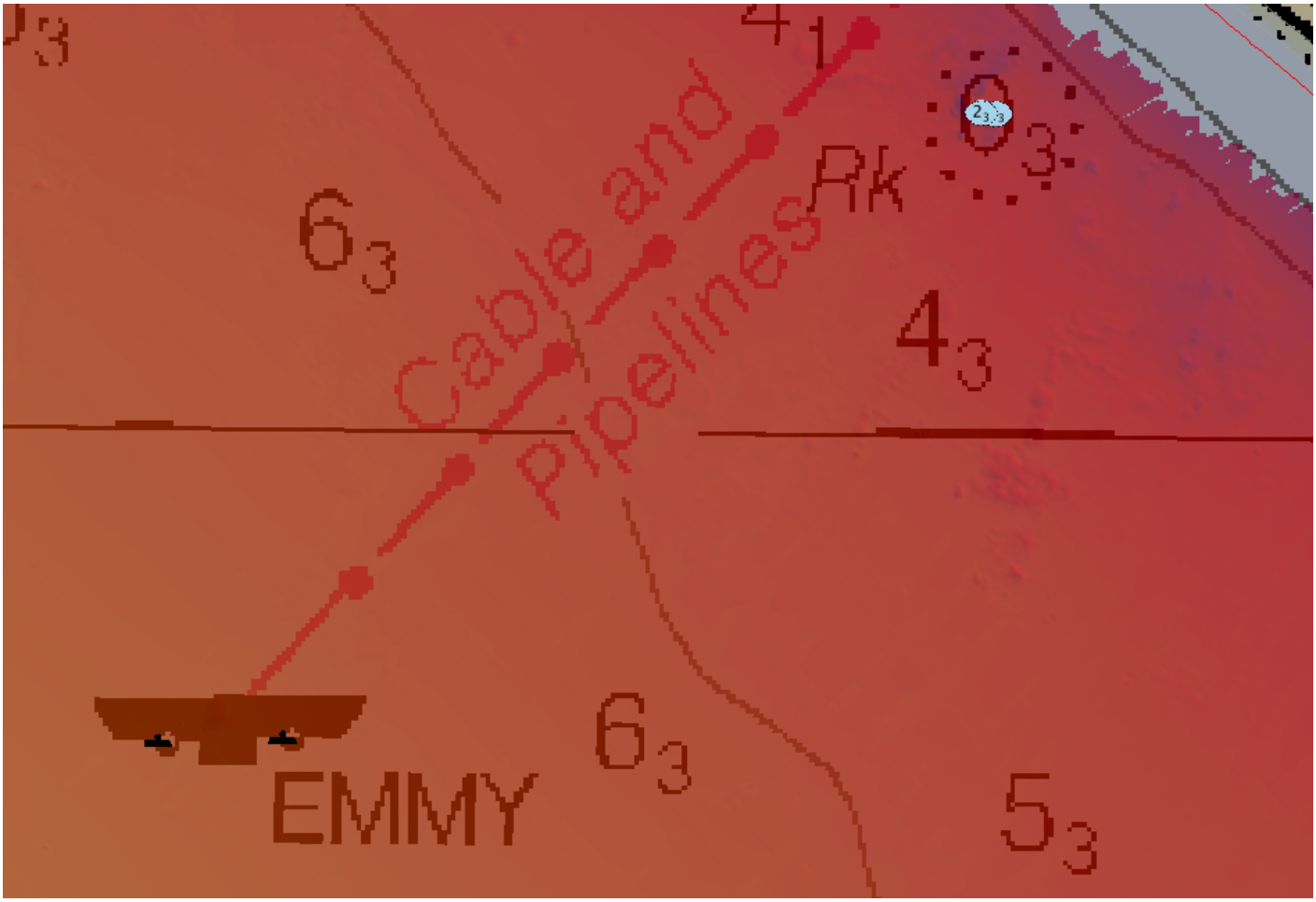


Figure 20: H12620 Charted rock Northeast of platform Emmy

Figure 21: H12620 Charted rock East of platform Emmy new position

D.1.9 Channels

Survey H12620 extends along a portion of the Southern border of the channel entrance to Anaheim Bay, but was not investigated.

D.1.10 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

No shoreline features were present within the bounds of this survey.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Survey H12620 included two Aids to navigation (ATONs). The ATONs were found to serve their intended purpose.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

Survey H12620 includes three charted cable and pipeline areas on chart 18746 and two on chart 18749, as shown in Figures 22 and 23. While only one pipeline is charted as being attached to platform Emmy on chart 18746, multiple pipelines were observed in the area. The Hydrographer recommends retaining the cable areas as charted.

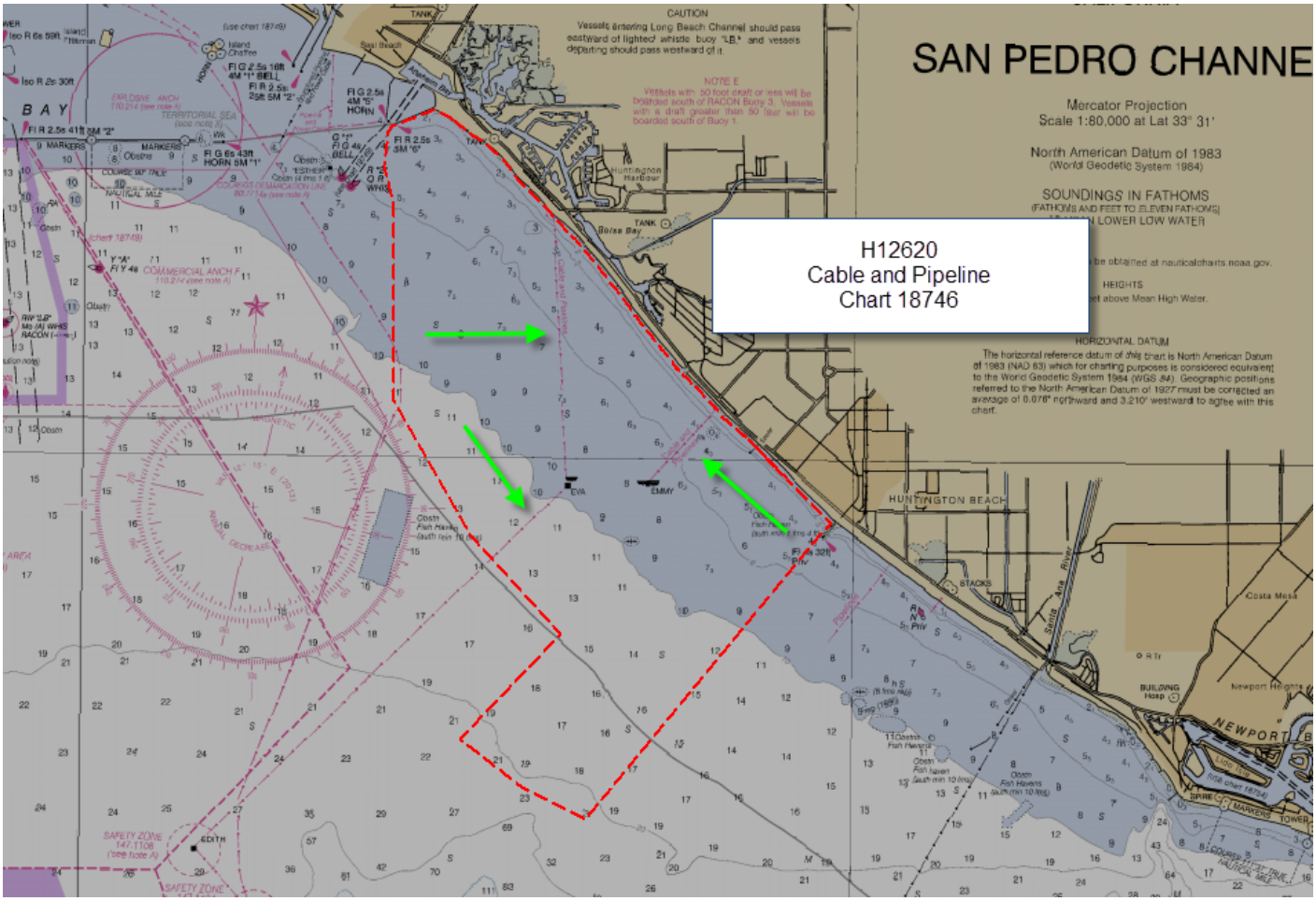


Figure 22: H12620 Cable and Pipeline areas on chart 18746.

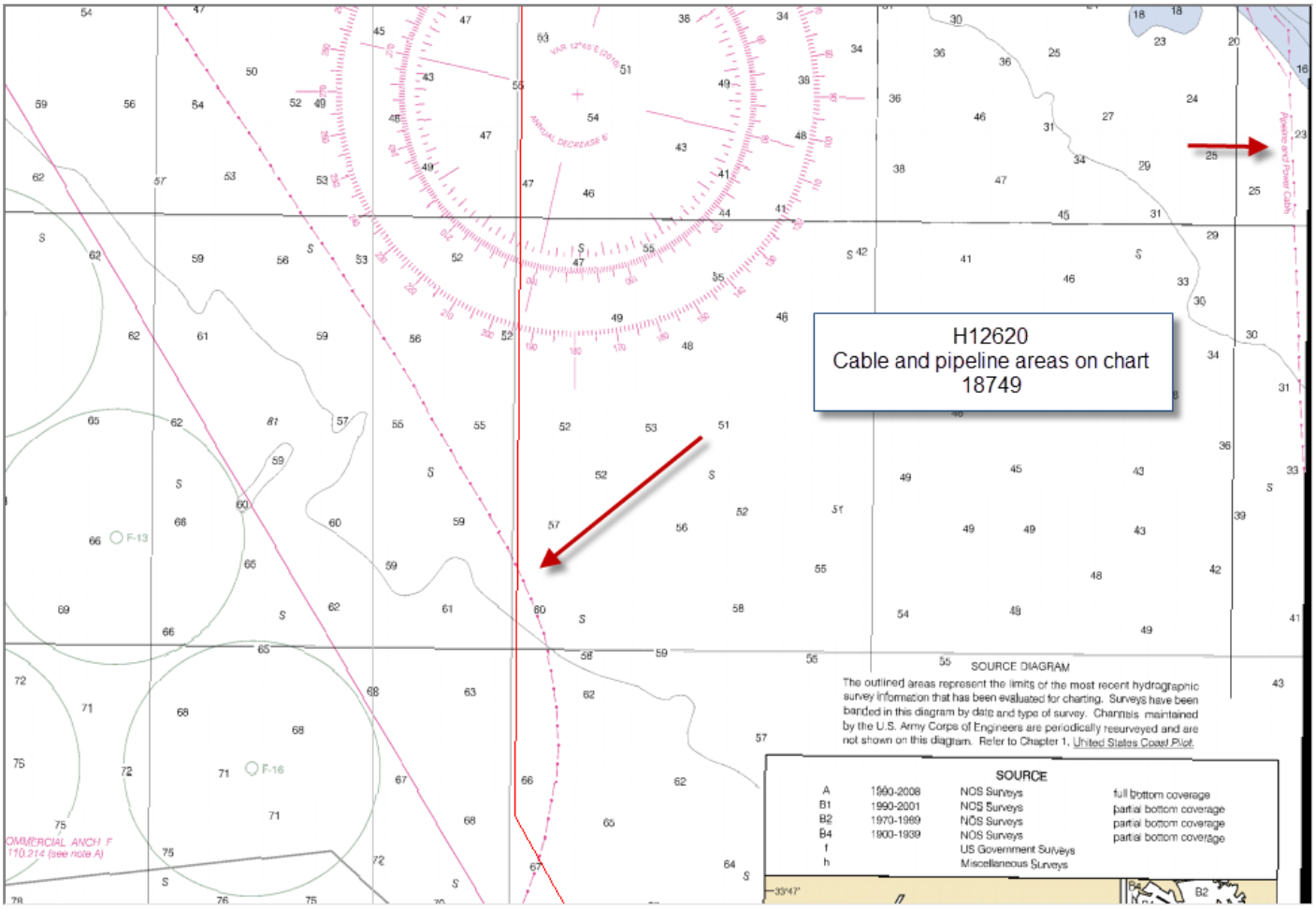


Figure 23: H12620 Cable and Pipeline areas on chart 18749

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

Survey H12620 contains two permanent platforms on chart 18746. Figure 24 shows these platforms as being charted correctly. After verification, the platform data was removed from HIPS surfaces. Figure 13 under Holiday Assessment shows the resulting holidays around Platform Emmy.

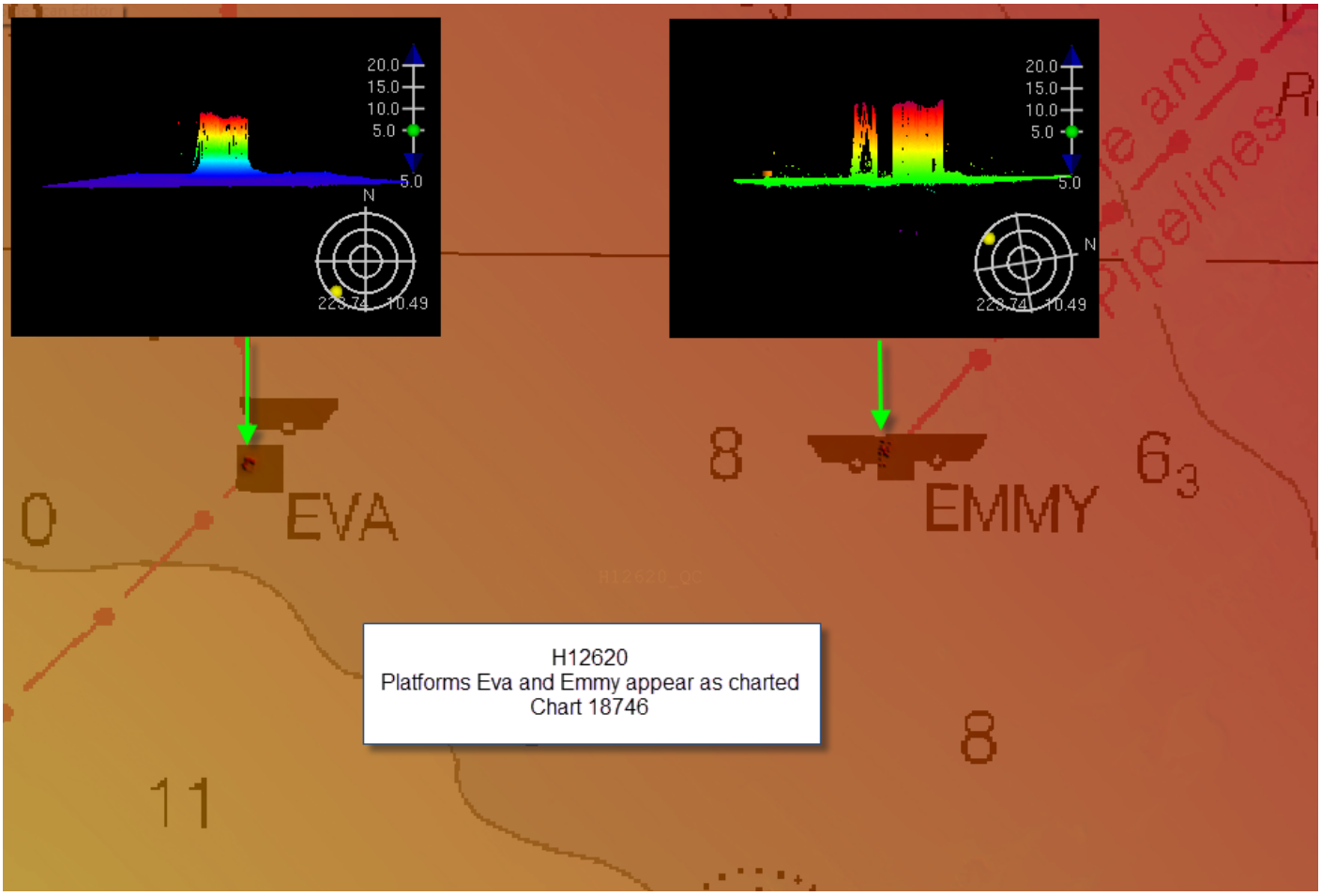


Figure 24: H12620 Platforms Eva and Emmy on chart 18746.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendation

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

D.2.11 Inset Recommendation

No new insets are recommended for this area.

E. Approval Sheet

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Report Name	Report Date Sent
Data Acquistion and Processing Report	2013-05-21
Coast Pilot Report	2013-11-15

Approver Name	Approver Title	Approval Date	Signature
CDR David J. Zezula, NOAA	Commanding Officer	05/21/2014	David Zezula 2014.05.23 11:58:16 -08'00'
LT Ryan A. Wartick, NOAA	Field Operations Officer	05/21/2014	Ryan Wartick 2014.05.23 10:13:51 -08'00'
CST Tami M. Beduhn	Chief Survey Technician	05/21/2014	Tami Beduhn 2014.05.23 10:24:20 -08'00'
HSST Clinton R. Marcus	Sheet Manager	05/21/2014	Clinton Marcus 2014.05.23 11:42:46 -08'00'

F. Table of Acronyms

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

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

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

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : November 15, 2013

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-L318-FA-2013
HYDROGRAPHIC SHEET: H12620

LOCALITY: Approaches to Long Beach, Long Beach, CA
TIME PERIOD: November 02 - November 11, 2013

TIDE STATION USED: 9410660 Los Angeles, CA
Lat. 33° 43.2'N Long. 118° 16.3' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.448 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-L318-FA-2013, H12620, during the time period between November 02 - November 11, 2013.

Please use the zoning file L318FA2013CORP_Rev submitted with the project instructions for OPR-L318-FA-2013. Zone PAC9 is the applicable zone for H12620.

Refer to attachments for zoning information.

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

HOVIS.GERALD.THOMAS.1365860250

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2013.11.19 12:12:02 -05'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary as Final Tidal Zoning for
OPR-L318-FA-2013 (Revised), Registry No. H12620
Approaches to Long Beach, Long Beach, CA
9410660 Los Angeles, CA
PAC9
Time Corrector 0 mins
Range Corrector x 0.97
Reference 9410660
0
25
nautical miles
Scale: 1:1,561,000
bing
Image courtesy of NASA State of Michigan

H12620 Feature Report

Registry Number: H12620
State: California
Locality: Long Beach
Sub-locality: Approaches to Long Beach
Project Number: OPR-L318-FA-13
Survey Dates: November 2, 2013 - November 11, 2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18749	43rd	04/01/2010	1:20,000 (18749_1)	USCG LNM: 5/13/2014 (5/20/2014) NGA NTM: 6/22/1996 (5/31/2014)
18746	39th	06/01/2013	1:80,000 (18746_1)	USCG LNM: 11/19/2013 (5/20/2014) NGA NTM: 5/21/2005 (5/31/2014)
18740	42nd	03/01/2007	1:234,270 (18740_1)	[L]NTM: ?
18022	35th	08/01/2005	1:868,003 (18022_1)	[L]NTM: ?
18020	38th	10/01/2007	1:1,444,000 (18020_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

Feature Type	Survey Depth	Survey Latitude	Survey Longitude
Wreck	15.58 m	33° 39' 07.8" N	118° 02' 51.0" W
Wreck	7.62 m	33° 42' 51.3" N	118° 05' 02.3" W
Wreck	14.60 m	33° 38' 50.6" N	118° 02' 15.5" W

1 - Charted Features

1.1) 0_ 0000000461 00001

Survey Summary

Survey Position:	33° 39' 07.8" N, 118° 02' 51.0" W
Least Depth:	15.58 m (= 51.12 ft = 8.519 fm = 8 fm 3.12 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-315.00:00:00.000 (11/11/2013)
Dataset:	H12620_FeatureReport.000
FOID:	0_ 0000000461 00001(FFFE000001CD0001)
Charts Affected:	18746_1, 18740_1, 18022_1, 18020_1, 501_1, 530_1, 50_1

Remarks:

AWOIS item #53262 found by MBES. New least depth and position of charted wreck acquired.

Hydrographer Recommendations

Reposition charted wreck as surveyed.

Cartographically-Rounded Depth (Affected Charts):

8 ½fm (18746_1, 18740_1, 18022_1, 18020_1, 530_1)

15.6m (501_1, 50_1)

S-57 Data

Geo object 1:	Wreck (WRECKS)
Attributes:	CATWRK - 1:non-dangerous wreck Office Note: CATWRK is dangerous
	QUASOU - 6:least depth known
	SORDAT - 20131111
	SORIND - us,us,graph,H12620
	TECSOU - 3:found by multi-beam
	VALSOU - 15.580 m
	WATLEV - 3:always under water/submerged

Office Notes

Concur

Feature Images

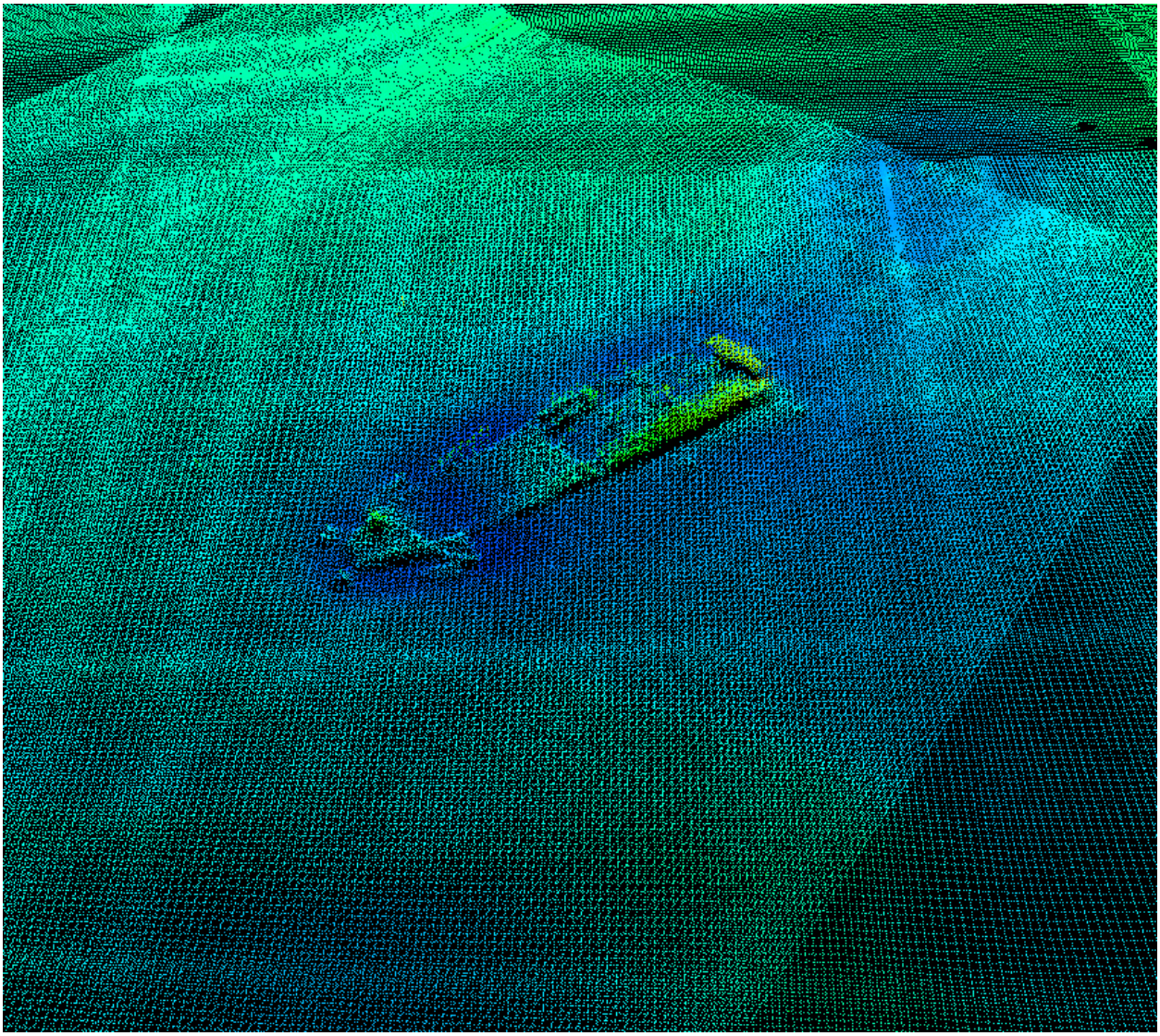

Figure 1.1.1

2 - New Features

2.1) 0_ 0000000664 00001

Survey Summary

Survey Position:	33° 42' 51.3" N, 118° 05' 02.3" W
Least Depth:	7.62 m (= 25.00 ft = 4.167 fm = 4 fm 1.00 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-315.00:00:00.000 (11/11/2013)
Dataset:	H12620_FeatureReport.000
FOID:	0_ 0000000664 00001(FFFE000002980001)
Charts Affected:	18749_1, 18746_1, 18740_1, 18022_1, 18020_1, 501_1, 530_1, 50_1

Remarks:

WRECKS/remrks: New wreck observed by full coverage MBES.

Hydrographer Recommendations

chart new wreck as surveyed.

Cartographically-Rounded Depth (Affected Charts):

25ft (18749_1)

4fm (18746_1, 18740_1, 18022_1, 18020_1, 530_1)

7.6m (501_1, 50_1)

S-57 Data

Geo object 1:	Wreck (WRECKS)
Attributes:	CATWRK - 1:non-dangerous wreck Office Note: CATWRK is dangerous
	QUASOU - 6:least depth known
	SORDAT - 20131111
	SORIND - US,US,graph,H12620
	TECSOU - 3:found by multi-beam
	VALSOU - 7.620 m
	WATLEV - 3:always under water/submerged

Office Notes

Concur

Feature Images

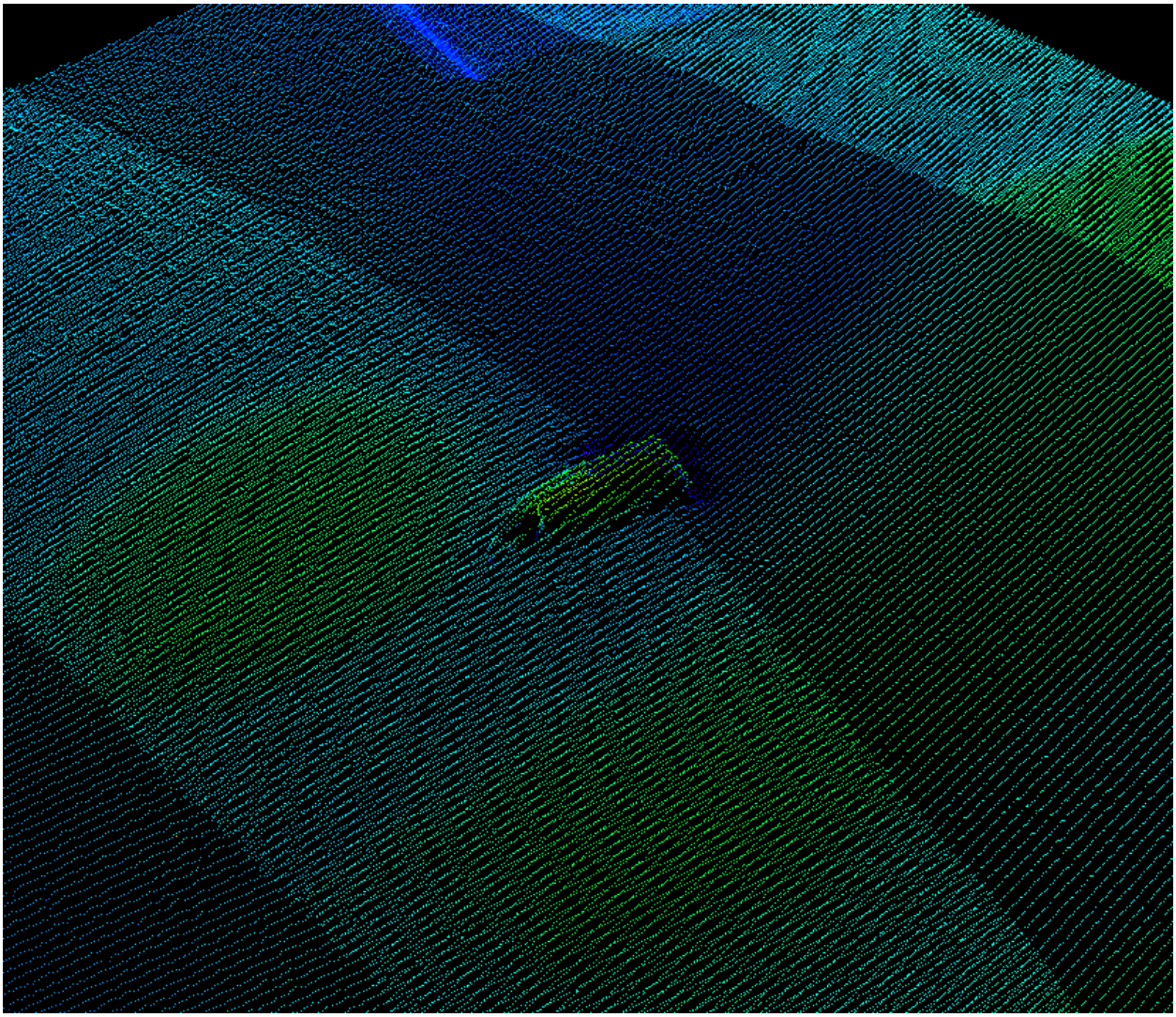

Figure 2.1.1

2.2) 0_ 0000000715 00001

Survey Summary

Survey Position:	33° 38' 50.6" N, 118° 02' 15.5" W
Least Depth:	14.60 m (= 47.90 ft = 7.983 fm = 7 fm 5.90 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-315.00:00:00.000 (11/11/2013)
Dataset:	H12620_FeatureReport.000
FOID:	0_ 0000000715 00001(FFFE000002CB0001)
Charts Affected:	18746_1, 18740_1, 18022_1, 18020_1, 501_1, 530_1, 50_1

Remarks:

WRECKS/remrks: New wreck observed by full coverage MBES.

Hydrographer Recommendations

Chart new wreck as surveyed.

Cartographically-Rounded Depth (Affected Charts):

8fm (18746_1, 18740_1, 18022_1, 18020_1, 530_1)

14.6m (501_1, 50_1)

S-57 Data

Geo object 1:	Wreck (WRECKS)
Attributes:	CATWRK - 1:non-dangerous wreck Office note: CATWRK is dangerous
	QUASOU - 6:least depth known
	SORDAT - 20131111
	SORIND - US,US,graph,H12620
	TECSOU - 3:found by multi-beam
	VALSOU - 14.600 m
	WATLEV - 3:always under water/submerged

Office Notes

Concur

Feature Images

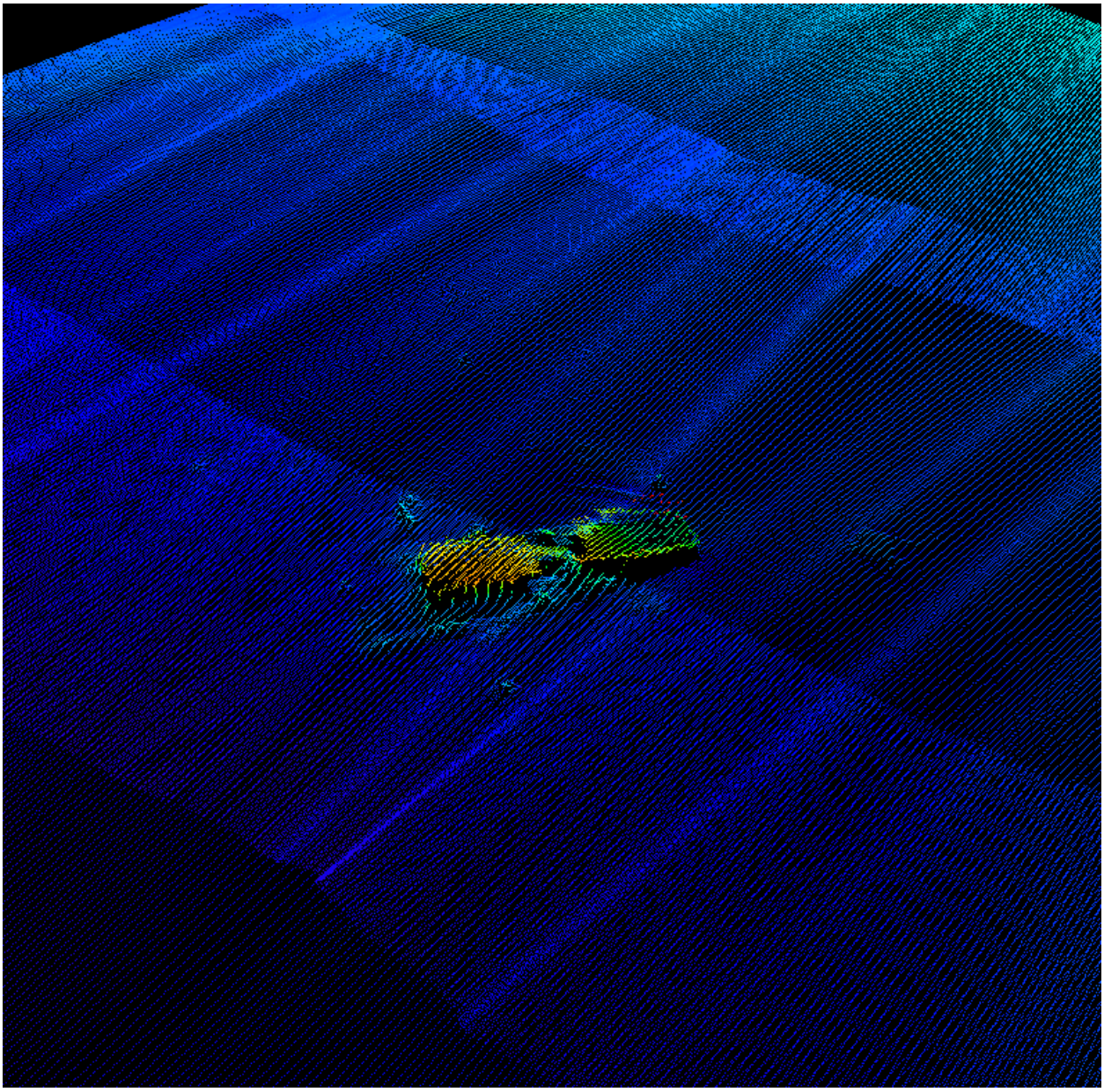

Figure 2.2.1

APPROVAL PAGE

H12620

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- H12620_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12620_GeoImage.pdf

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

Digitally signed by HOLMBERG.PETER.SCOTT.1365886101
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOLMBERG.PETER.SCOTT.1365886101
Date: 2015.01.14 15:06:10 -08'00'

Approved:_____

Peter Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch

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

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Reason: I am approving this document
Date: 2015.01.14 17:15:03 -08'00'

Approved:_____

CDR Benjamin K. Evans, NOAA
Chief, Pacific Hydrographic Branch