

F00635

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

DESCRIPTIVE REPORT

Type of Survey: Field Examination

Registry Number: F00635

LOCALITY

State(s): California

General Locality: San Francisco

Sub-locality: Pier 1, San Francisco

2013

CHIEF OF PARTY
Laura Pagano

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00635

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: **San Francisco**

Sub-Locality: **Pier 1, San Francisco**

Scale: **10000**

Dates of Survey: **09/17/2013 to 09/17/2013**

Instructions Dated: **09/16/2013**

Project Number: **S-L927-NRT6-13**

Field Unit: **Navigation Response Team 6**

Chief of Party: **Laura Pagano**

Soundings by: **Multibeam Echo Sounder**

Imagery by:

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 Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

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Descriptive Report to Accompany Survey F00635

Project: S-L927-NRT6-13
 Locality: San Francisco
 Sublocality: Pier 1, San Francisco
 Scale: 1:10000
 September 2013 - September 2013
Navigation Response Team 6
 Chief of Party: Laura Pagano

A. Area Surveyed

Survey F00635 encompasses the ruins of Pier 1/2 and adjacent Pier 1, San Francisco.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
37° 47' 56" N 122° 23' 41" W	37° 47' 45" N 122° 23' 28" W

Table 1: Survey Limits

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

A.2 Survey Purpose

San Francisco Police Department requested NRT6 to do a hydrographic survey around Pier 1 in the Port of San Francisco. Pier 1 was the location for an emergency response drill, that included divers in the water, scheduled for October 8, 2013.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

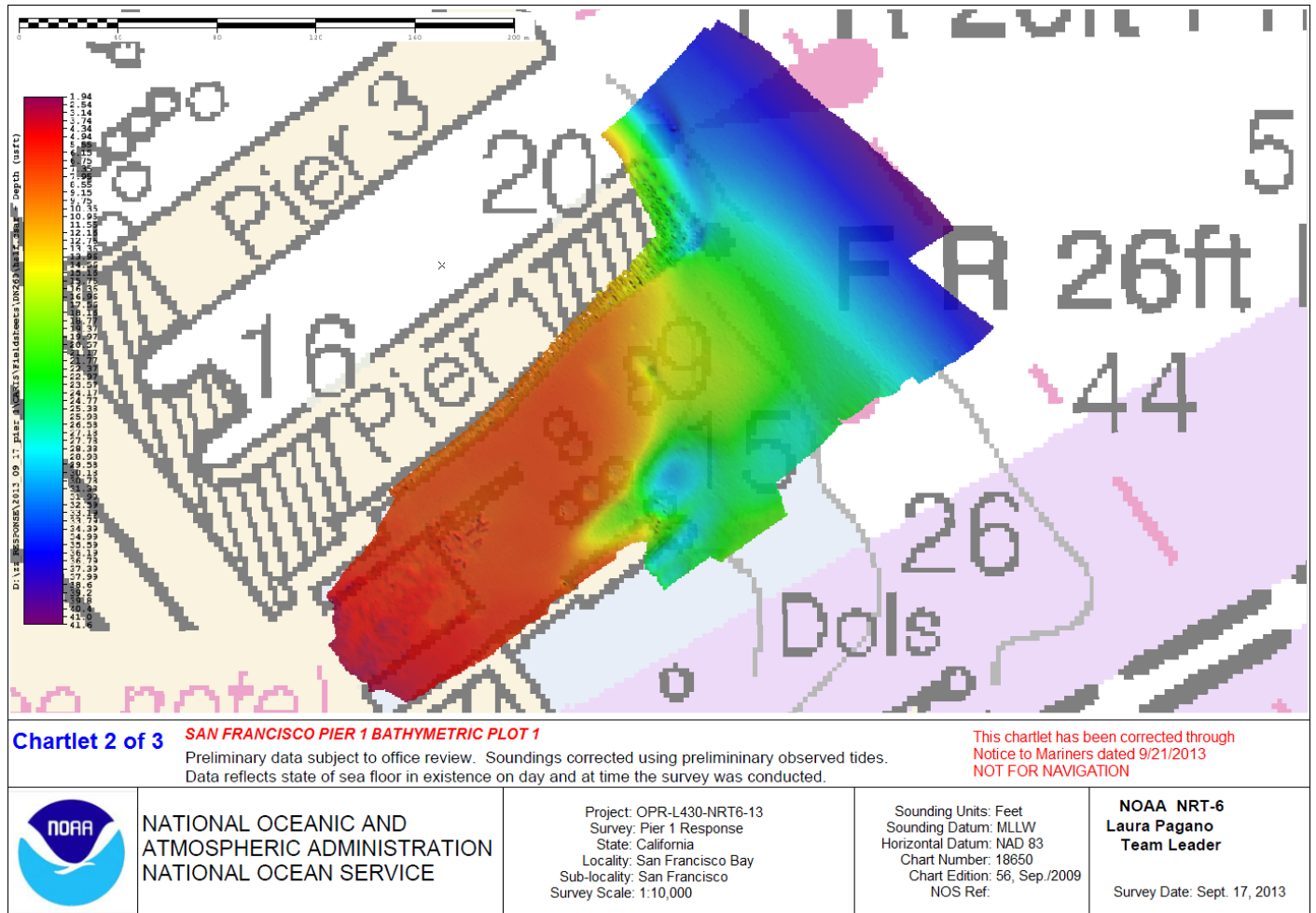


Figure 1: Coverage graphic for Survey F00635.

Survey Coverage was in accordance with the requirements in the Project Instructions and the HSSD.

A.5 Survey Statistics

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

	HULL ID	<i>S3003</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	2.58	2.58
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/MBES Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	0	0
	Lidar Crosslines	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			0.00897

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/17/2013	260

Table 3: Dates of Hydrography

Due to the nature of this response survey, crosslines were not collected.

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	<i>S3003</i>
LOA	33 feet
Draft	1.6 feet

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM3002	MBES

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 0% of mainscheme acquisition.

Due to the nature of this response survey, crosslines were not collected. Field Unit verbally communicated with Headquarters for guidance. Considering survey operations were completed within two hours and consisted of robust overlap coverage, it was deemed not appropriate to warrant an additional survey day to collect crosslines.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S3003	4.0 meters/second		0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Uncertainty values of submitted, finalized grids are calculated in CARIS HIPS & SIPS using the "Greater of the Two" of total propagated uncertainty and standard deviation (scaled to 95%). An "IHO-ness" attribute layers were created for the F00635 finalized surface in CARIS HIPS & SIPS for analysis. Uncertainty values throughout the survey meet IHO Special Order (Object Detection) specifications with the exception of those areas shown in red (see Figure 2).

Note: uncertainty values are zero because supplied values in the Water Level Instructions (L927NRT62013.doc) were for New London, CT.

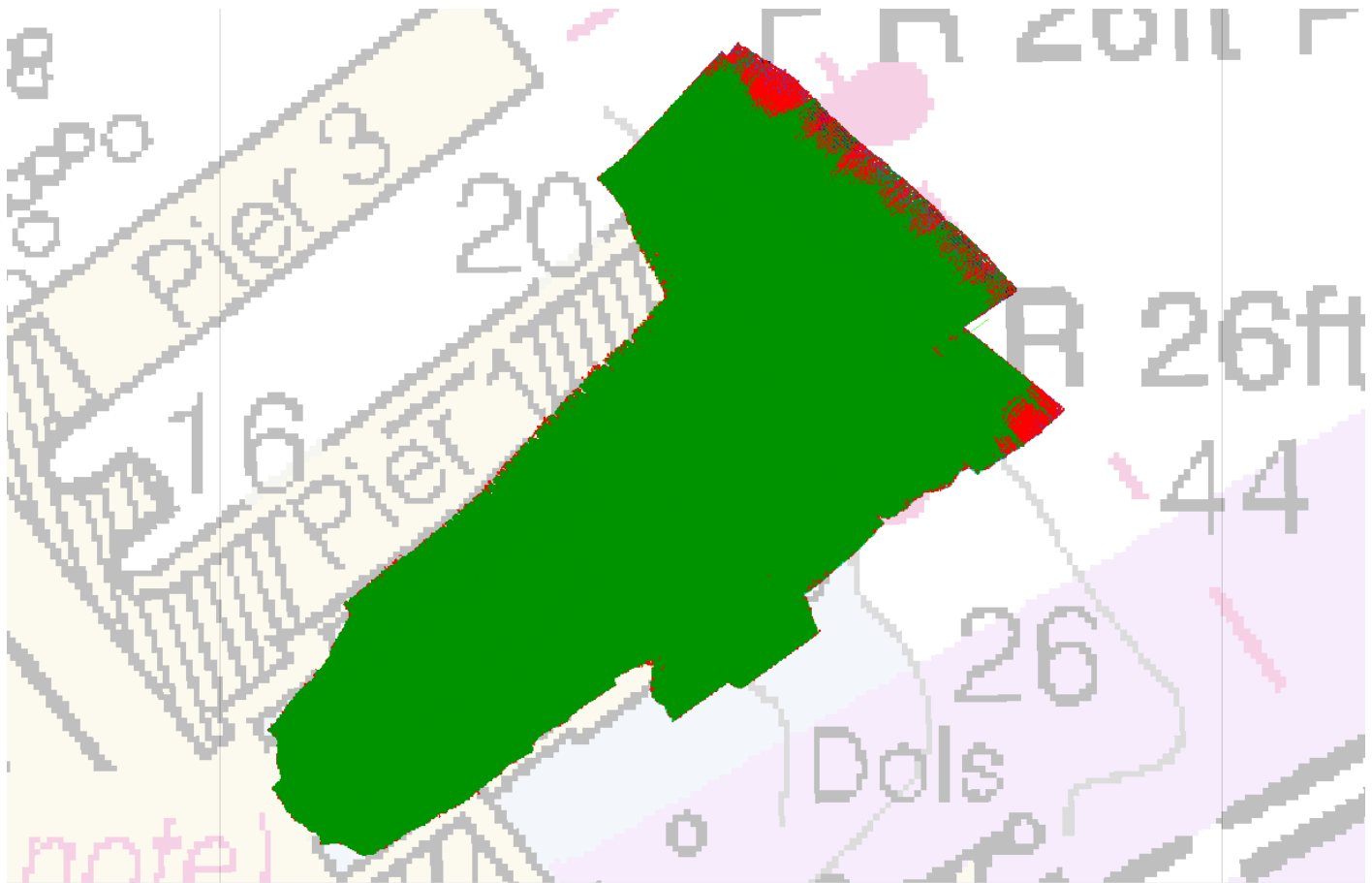


Figure 2: All data colored green meets IHO Special Order specifications. Red does not.

The uncertainty was recalculated using the minimum tide values listed in NOAA's Field Procedures Manual. The final uncertainty is within NOAA's specifications for Order 1 surveys. F00635 is not a Special Order Survey. The Object Detection requirement refers to an object detection and data density per node requirement which the survey meets. No soundings were selected from the red areas.

B.2.3 Junctions

There are no survey junctions with Survey F00635.

There are no contemporary surveys that junction with this survey.

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

KONGSBERG SIMRAD EM3002 SYSTEMATIC ERROR, "DEVIL HORNS"

The Kongsberg Simrad EM3002 sonar exhibited a consistent systematic error: two downward along-track spikes were consistently evident near 9-12 degrees either side of nadir.

However, the half meter CUBE surface negated the error to within 0.1 - 0.2 meters, well within IHO Order 1 and Special Order standards.

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Because of the short duration for survey operations for survey F00635, only one cast was taken/used.

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

Backscatter was not collected for this survey.

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: S-57 ENC 3.1

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
F00635_0_5m	CUBE	0.5 meters	0.5 meters - 12.4 meters	NOAA_0.5m	Object Detection
F00635_0_5m_Final	CUBE	0.5 meters	0.5 meters - 12.4 meters	NOAA_0.5m	Object Detection

Table 8: Submitted Surfaces

One field sheet was created for survey F00635. A half meter CUBE surface and half meter finalized CUBE surface is submitted to fulfill IHO Object Detection requirements. However, considering the nature of the response survey, data was collected and cleaned to a 0.1 meter Swath Angle surface resolution. Therefore it is feasible to generate much higher cleaned resolution surfaces, if the need should present itself.

C. Vertical and Horizontal Control

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

C.1 Vertical Control

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

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
San Francisco	9414290

Table 9: NWLON Tide Stations

File Name	Status
9414290.tid	Final Approved

Table 10: Water Level Files (.tid)

File Name	Status
L927NRT62013CORP.zdf	Final

Table 11: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 10/08/2013. The final tide note was received on 10/24/2013.

All bathymetry for survey F00635 reside within supplied zoning polygon.

Tide file 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 10.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Pigeon Point, CA (287 kHz)

Table 12: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

CHART COMPARISON

CHART COMPARISON, SOUNDINGS.

Two soundings reside within survey F00635. Bathymetric 15 foot sounding is 6 feet deeper than charted 9 foot depth. Bathymetric 24 foot sounding is 9 feet deeper than charted 15 foot depth. The Hydrographer recommends bathymetry supersede as charted.

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
18650	1:20000	56	09/2009	09/24/2013	09/28/2013

Table 13: Largest Scale Raster Charts

18650

CHART COMPARISON, RASTER CHART 18650

Four charted piles are disproved by bathymetry located near the ruins of Pier 1/2 (37-47-50.46N, 122-23-36.01W). The Hydrographer recommends bathymetry supersede as charted. See Figure 3.

Pier 1/2 has been removed (37-47-48.26N, 122-23-38.98W). The Hydrographer recommends charting bathymetric ruins as obstruction. See Figure 4.

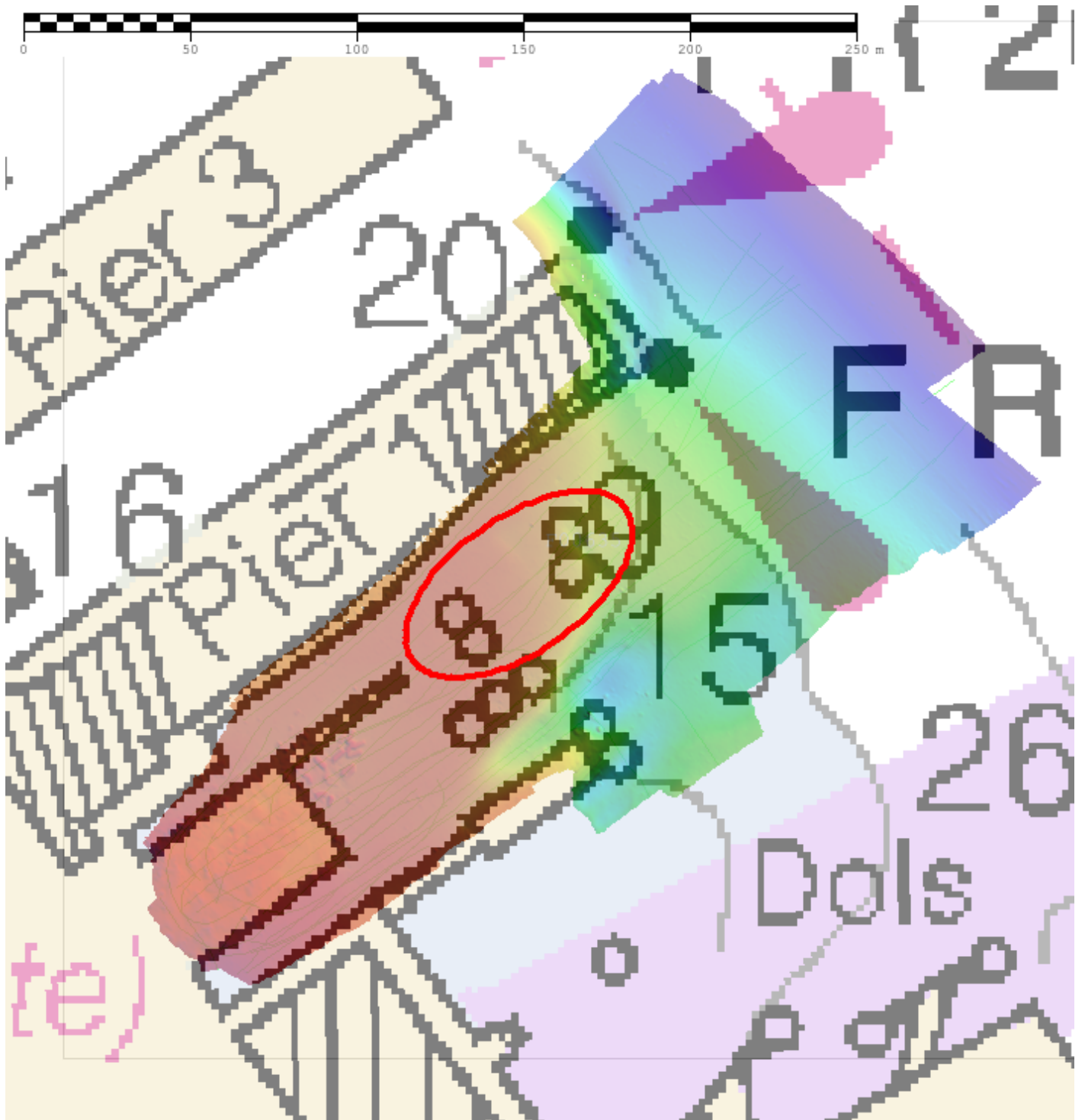


Figure 3: Piles, circled red, are disproven by bathymetry.

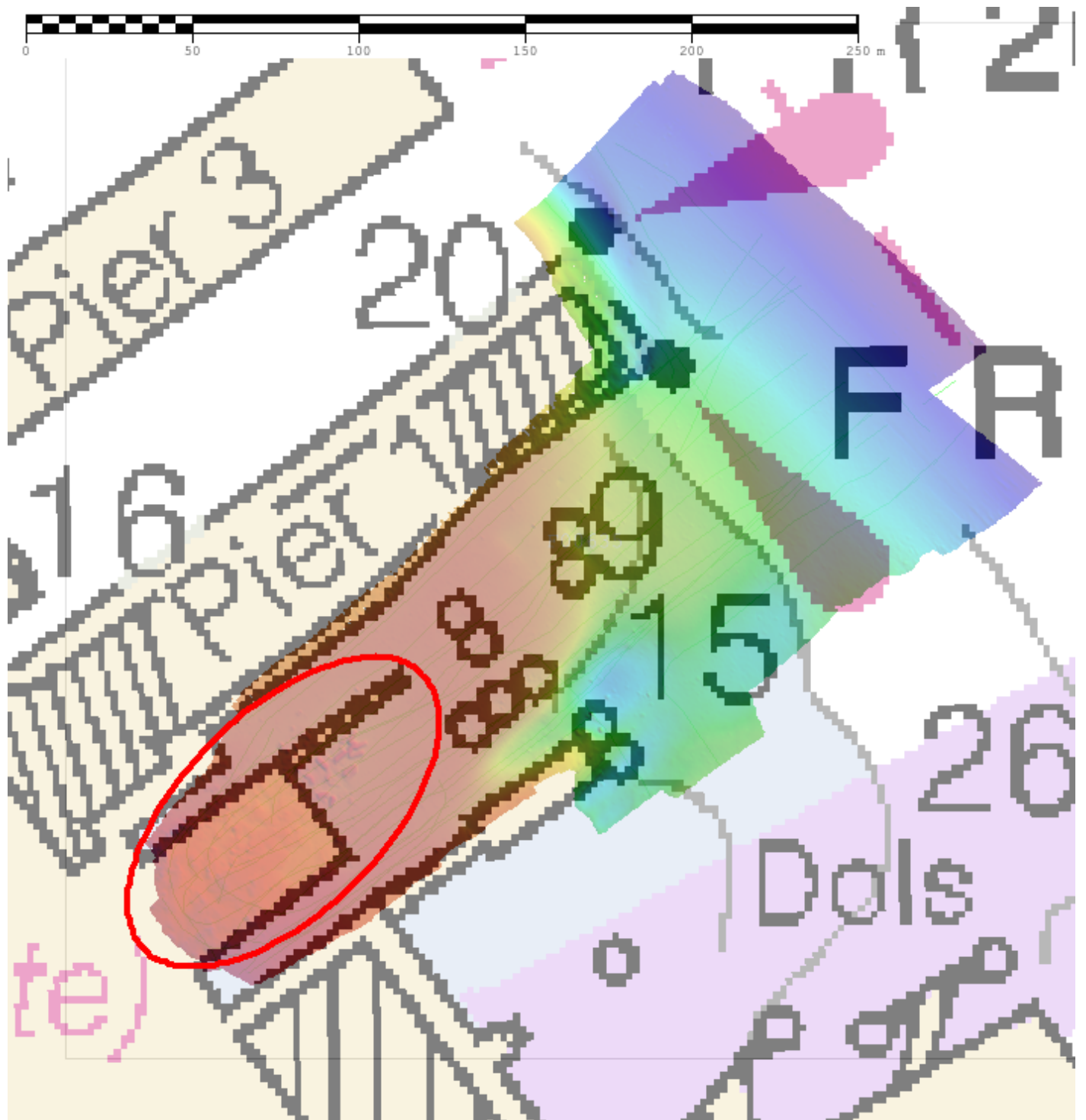


Figure 4: Pier 1/2, circled red, has been removed.

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3CA14M	1:20000	15	07/24/2013	07/24/2013	NO

Table 14: Largest Scale ENC's

US3CA14M

CHART COMPARISON, ENC

Four charted piles are disproved by bathymetry located near the ruins of Pier 1/2 (37-47-50.46N, 122-23-36.01W). The Hydrographer recommends bathymetry supersede as charted. See Figure 5.

Pier 1/2 has been removed (37-47-48.26N, 122-23-38.98W). The Hydrographer recommends charting bathymetric ruins as obstruction. See Figure 6.

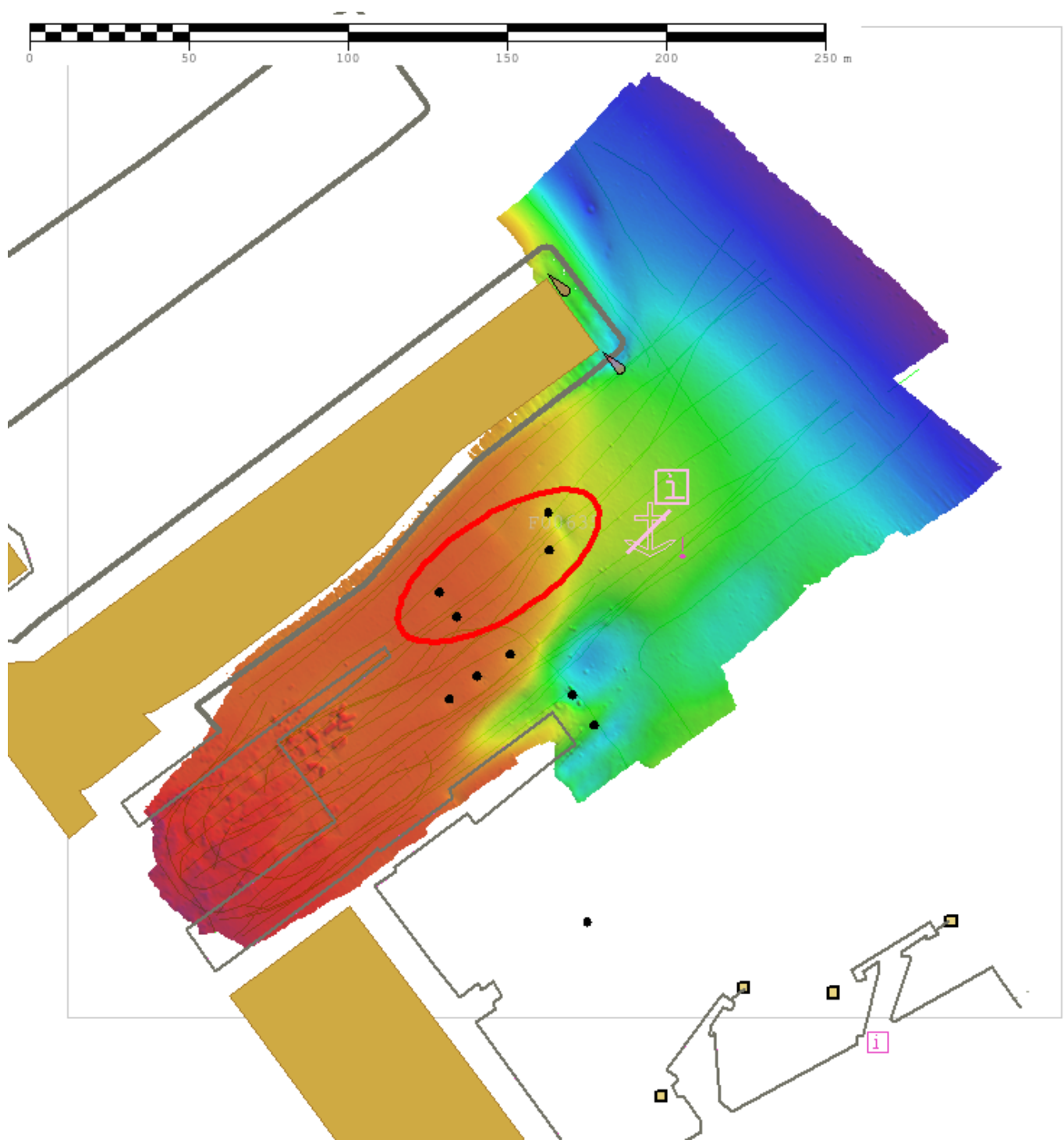


Figure 5: Piles, circled red, are disproven by bathymetry.

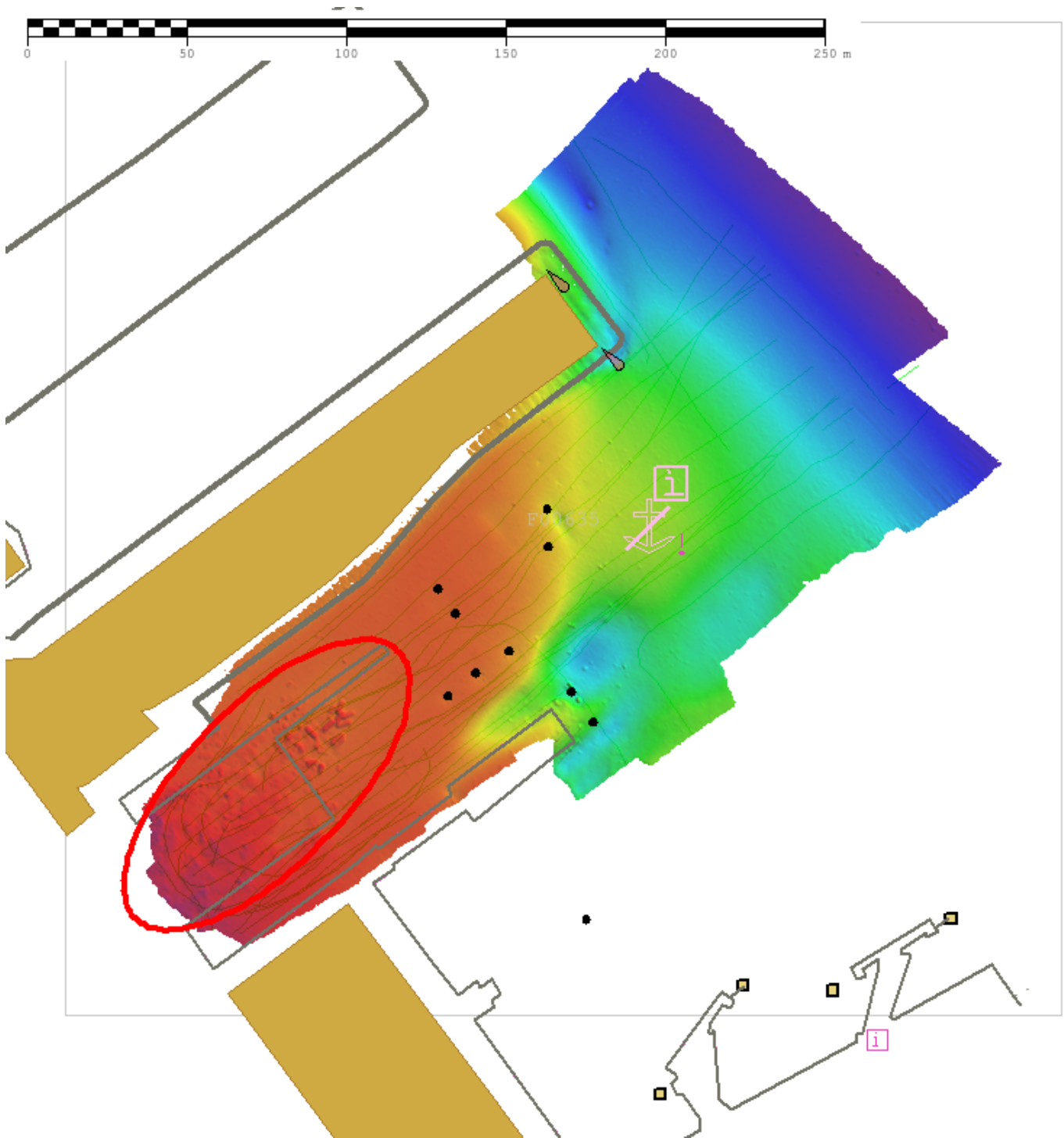


Figure 6: Pier 1/2, circled red, has been removed.

D.1.3 AWOIS Items

No AWOIS items were assigned for this survey.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

No charted features exist for this survey.

D.1.6 Uncharted Features

UNCHARTED OBSTRUCTIONS NEAR REMOVED PIER 1/2

A grouping of nearly a dozen features of similar characteristics were discovered in bathymetry near the charted Pier 1/2.(37-47-48.81N, 122-23-38.13W). Pier 1/2 has been removed. Each feature is approximately 4 meters long, 1 meter wide, shoalest depth 1 meter, with the most pronounced height above bottom 0.9 meters (see Figure 7). The Hydrographer recommends bathymetry supersede as charted and charting features as an obstruction, least depth known.

UNCHARTED PIER 1/2 RUINS

The area formerly occupied by the charted Pier 1/2 is in ruins (37-47-47.91N, 122-23-39.40W). Bathymetry shows a consistent rubble area 56 meters by 38 meters. The Hydrographer recommends bathymetry supersede as charted and chart the area as an obstruction.

UNCHARTED FEATURE NEAR APPROACH TO PIER 1

A feature, two meters by two meters, shoalest depth 32 feet, is located approximately 20 meters from Pier 1, (37-47-54.14N, 122-23-34.80W). The feature exhibits scouring. The Hydrographer recommends charting as an obstruction (see Figure 8).

THE FOUR RUINED PILES

What appears to be four ruined piles reside near the approach to the Port of San Francisco Tiburon route dock.

FEATURE 1: (37-47-49.11N, 122-23-34.99W) Length and width 0.2 meters, height above bottom two meters, least depth 6 meters. See Figure 9.

FEATURE 2: (37-47-49.26N, 122-23-35.11W) Length and width 0.5 meters, height above bottom two meters, least depth 6 meters. See Figure 10.

FEATURE 3: (37-47-49.42N, 122-23-34.89W) Length and width 0.5 meters, height above bottom 0.9 meters, least depth 8.1 meters. See Figure 11.

FEATURE 4: (37-47-49.58N, 122-23-35.10W) Length and width 0.2 meters, height above bottom 0.6 meters, least depth 7.7 meters. See Figure 12.

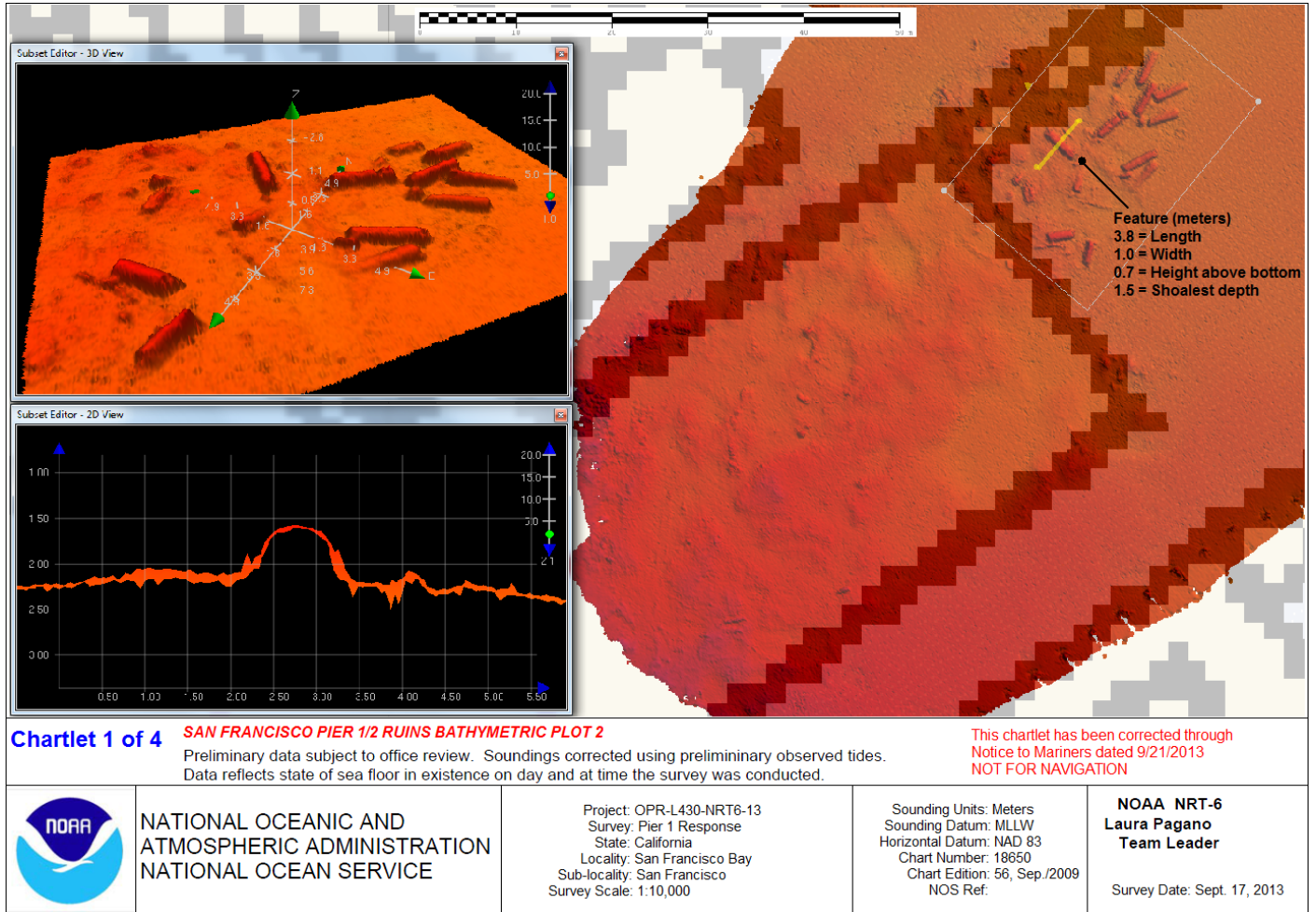


Figure 7: Uncharted features that lay outside of charted Pier 1/2 (Pier 1/2 has since been removed).

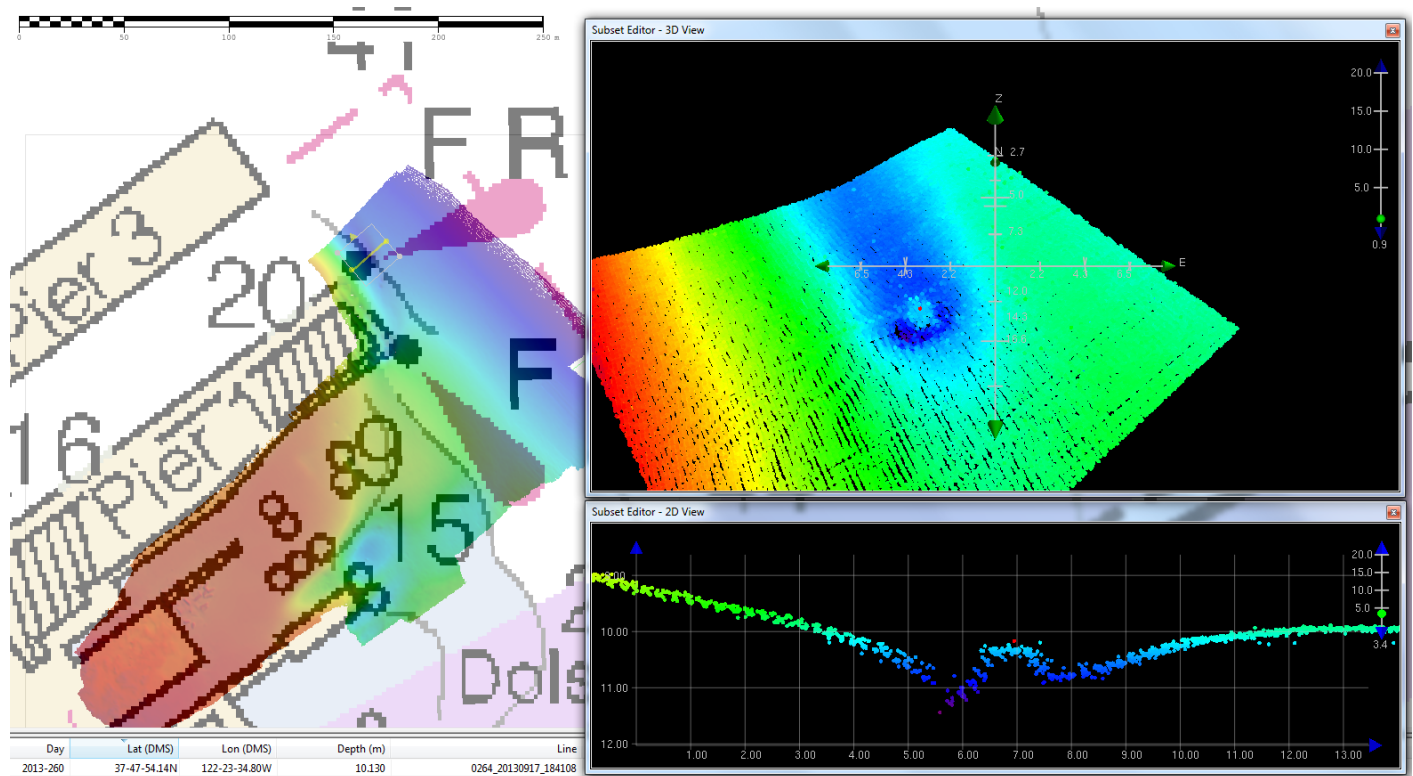


Figure 8: Uncharted feature located near Pier 1.

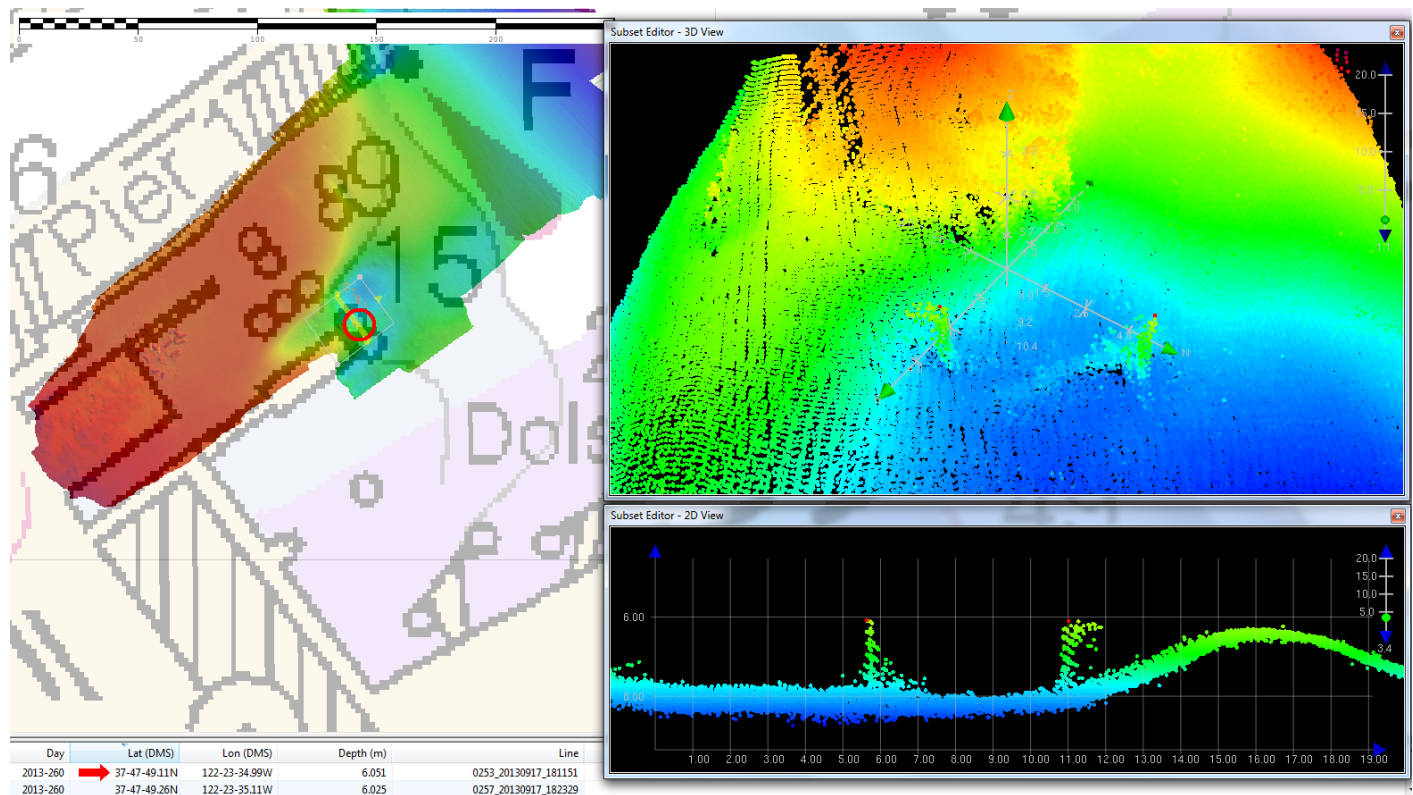


Figure 9: Feature 1 located near San Francisco Ferry terminal.

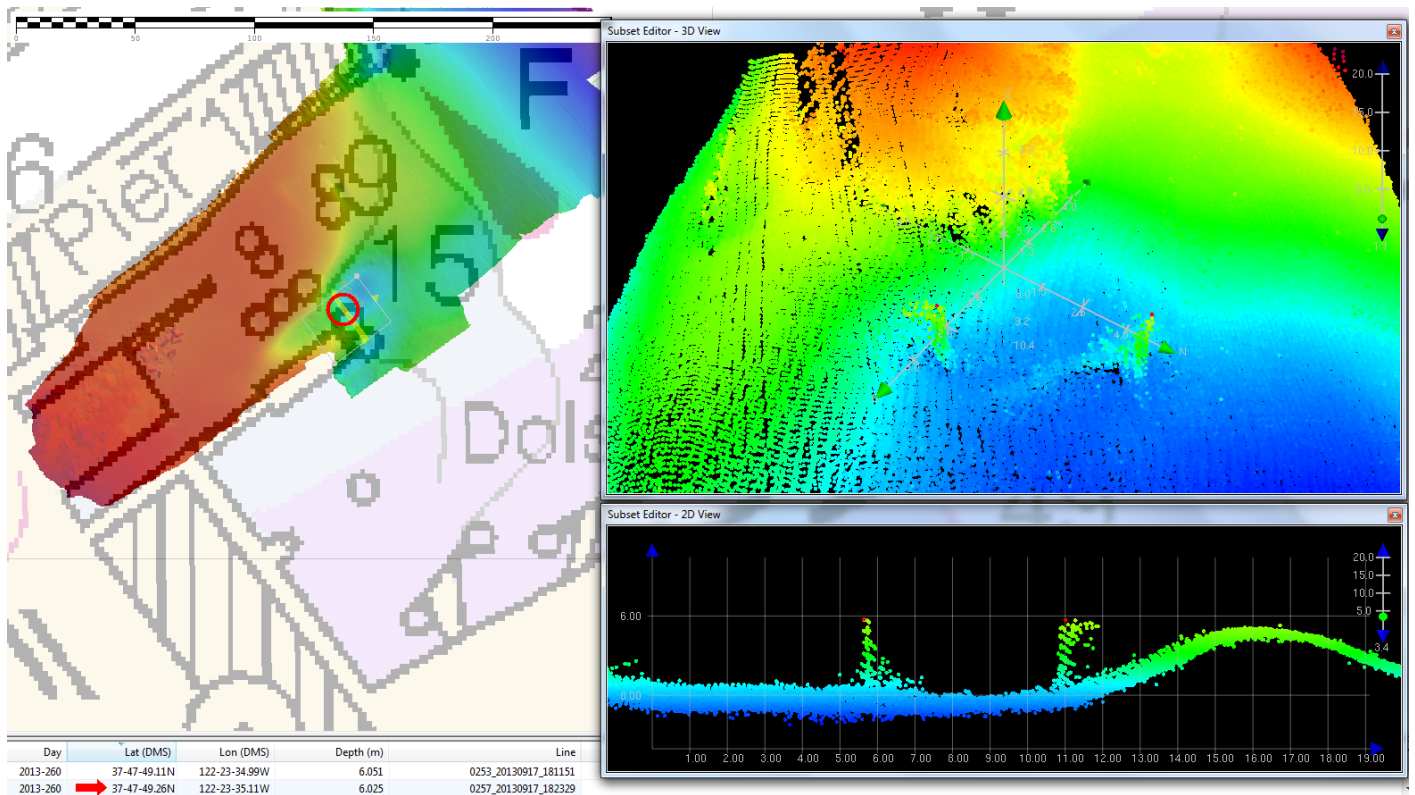


Figure 10: Feature 2 located near San Francisco Ferry terminal.

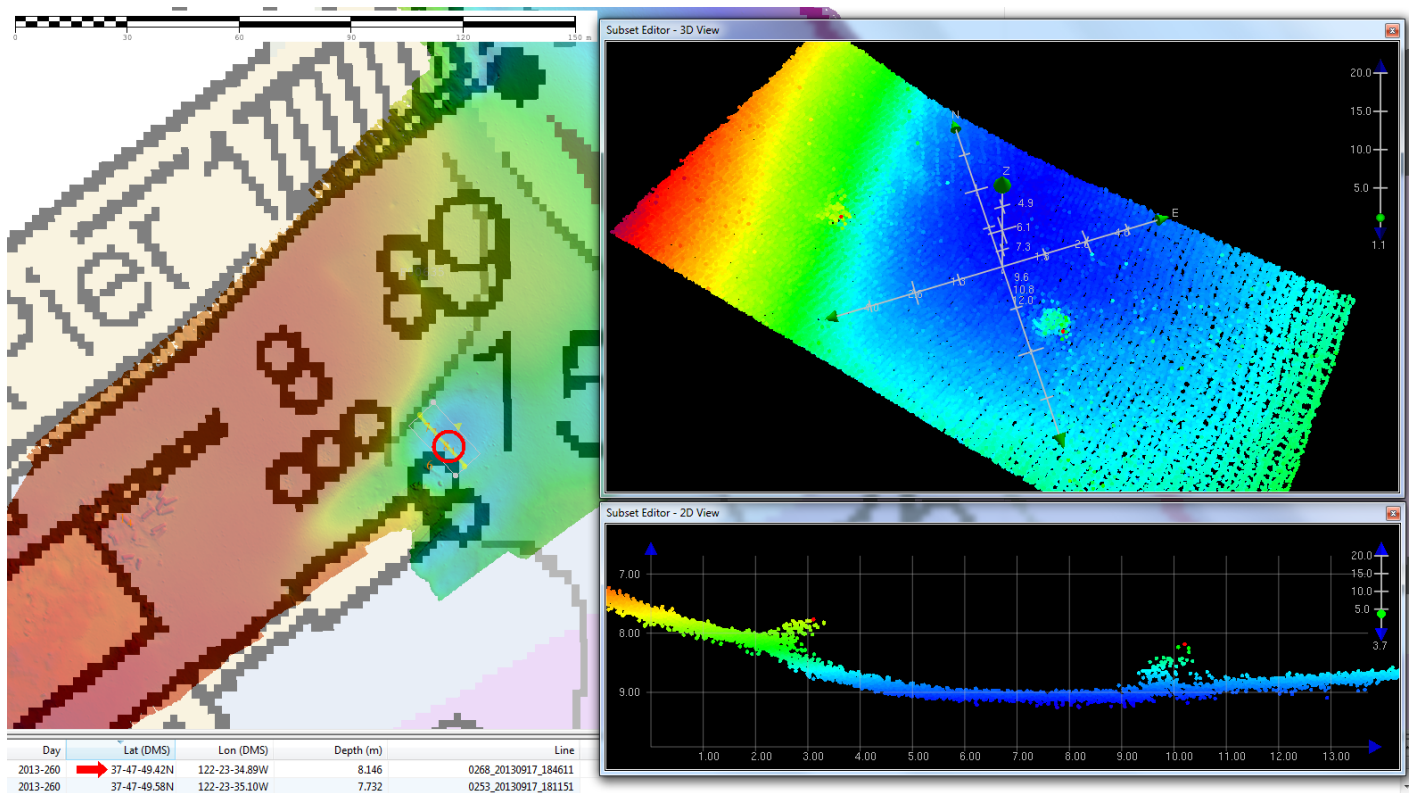


Figure 11: Feature 3 located near San Francisco Ferry terminal.

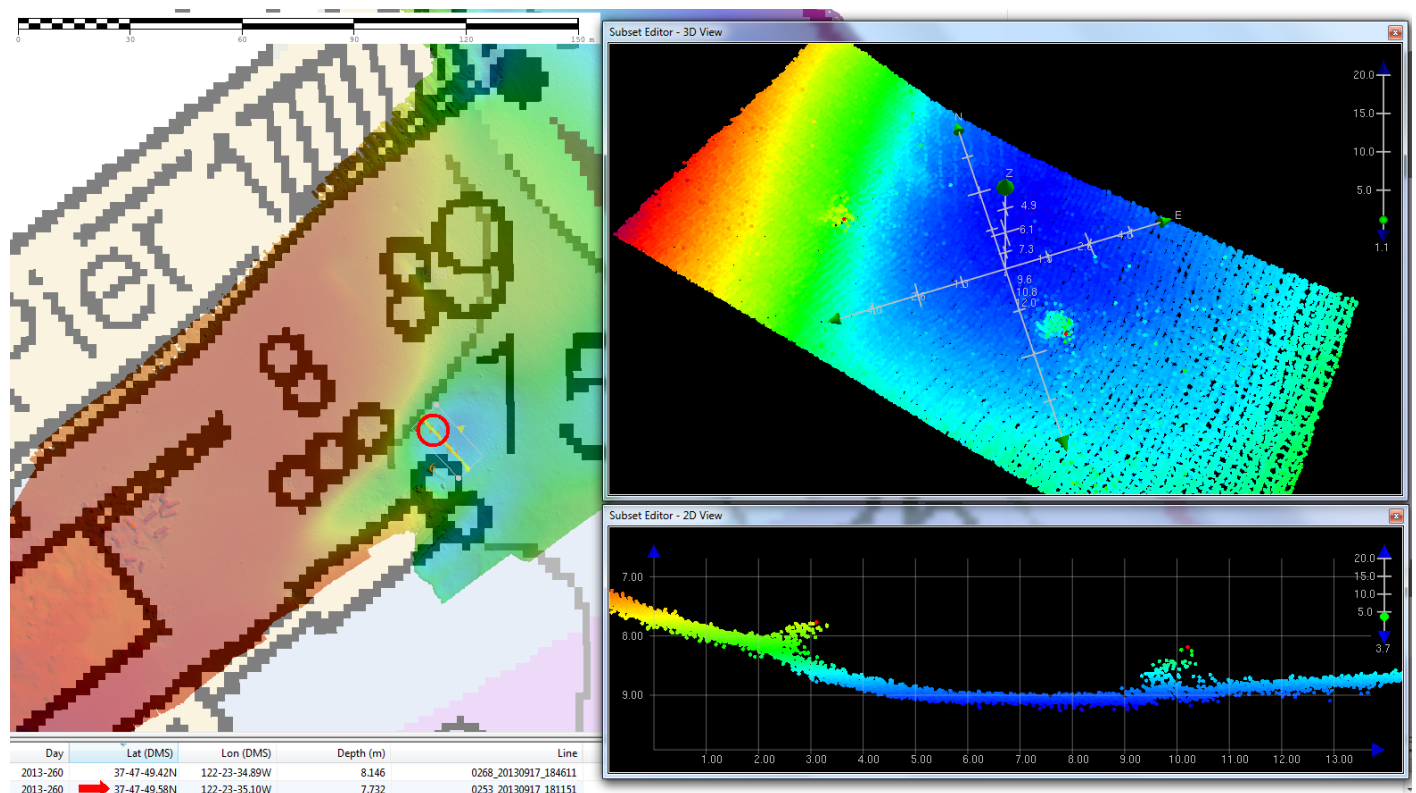


Figure 12: Feature 4 located near San Francisco Ferry terminal.

Two obstruction areas and two point feature obstructions were created and included in the chart update product to be charted.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

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

D.1.10 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

ATONS exist for survey F00635, and all were in strong agreement as charted.

There are no charted ATONs within the survey area. Two uncharted lights at the end of Pier 1 were included in the Composite Source File and verified by the field unit.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Ferry Routes and Terminals

Port of San Francisco Ferry Terminal exists within survey F00635 and are located as charted.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendation

Updated bathymetric survey of the San Francisco waterfront could be of great use and importance for the safety and commerce of San Francisco and our nation.

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.

Approver Name	Approver Title	Approval Date	Signature
Laura Pagano	Chief of Party	11/07/2013	PAGANO.LAURA.A.136588 5520 <small>Digitally signed by PAGANO.LAURA.A.136588520 DN: cn=US, o=U.S. Government, ou=DoD, ou=PR, ou=OTTR, cn=PAGANO.LAURA.A.136588520 Date: 2013.11.07 15:12:04 -08'00'</small>
Ian Colvert	Sheet Manager	11/07/2013	COLVERT.IAN.RICHARD.1294 078793 <small>Digitally signed by COLVERT.IAN.RICHARD.1294078793 DN: cn=US, o=U.S. Government, ou=DoD, ou=PR, ou=OTTR, ou=COLVERT.IAN.RICHARD.1294078793 Date: 2013.11.07 15:30:28 -08'00'</small>

F. Table of Acronyms

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

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



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 10, 2013

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: S-L927-NRT6-2013
HYDROGRAPHIC SHEET: F00635

LOCALITY: Pier 1, San Francisco, CA
TIME PERIOD: September 17, 2013

TIDE STATION USED: 9414290 San Francisco, CA
Lat. 37° 48.4'N Long. 122° 27.9' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.595 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project S-L927-NRT6-2013, F00635, on September 17, 2013.

Please use the zoning file L927NRT62013CORP submitted with the project instructions for S-L927-NRT6-2013. Zone SFB18 is the applicable zone for F00635.

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).

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THOMAS.13658
60250

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DN: c=US, o=U.S. Government,
ou=DoD, ou=PKI, ou=OTHER,
cn=HOVIS.GERALD.THOMAS.1365860
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CHIEF, PRODUCTS AND SERVICES BRANCH



**Preliminary as Final Tide Zoning for
S-L927-NRT6-2013, Registry No. F00635
Pier 1, San Francisco, CA**

**SFB18
Time Corrector 24 mins
Range Corrector x1.08
Reference 9414290**

9414290 SAN FRANCISCO, CA



nautical miles

APPROVAL PAGE

F00635

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

- F00635_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00635_GeoImage.pdf

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

Approved: _____

Kurt Brown

Physical Scientist, Pacific Hydrographic Branch

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

Approved: _____

CDR, Benjamin K. Evans, NOAA

Chief, Pacific Hydrographic Branch