

H11641

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

*Type of Survey* Hydrographic Survey

*Field No.* N/A

*Registry No.* H11641

### LOCALITY

*State* California

*General Locality* San Francisco Bay

*Sublocality* Raccoon Strait to Point San Pablo

2011

### CHIEF OF PARTY

Laura Pagano

### LIBRARY & ARCHIVES

DATE

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  <b>HYDROGRAPHIC TITLE SHEET</b>		REGISTRY No  <b>H11641</b>
<b>INSTRUCTIONS</b> – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.		FIELD No: N/A
State <u>California</u>		
General Locality <u>San Francisco Bay</u>		
Sub-Locality <u>Raccoon Strait to Point San Pablo</u>		
Scale <u>1:10,000</u>		Date of Survey <u>5/25/2010 - 1/12/2011</u>
Instructions dated <u>5/7/2010</u>		Project No. <u>OPR-L430-NRT6-10</u>
Vessel <u>NOAA Survey Launch S3003</u>		
<hr/>		
Chief of party <u>Laura Pagano</u>		
Surveyed by <u>Navigation Response Team Six Personnel</u>		
Soundings by <u>Simrad EM3000 Multibeam Echosounder</u>		
SAR by <u>Adam Argento</u>		Compilation by <u>Annie Raymond</u>
Soundings compiled in <u>Feet</u>		
<hr/>		
<b>REMARKS: All times are UTC. UTM Zone 10</b>		
<b>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 end 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.</b>		
<hr/>		
<b>All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <a href="http://www.ngdc.noaa.gov/">http://www.ngdc.noaa.gov/</a>.</b>		

Descriptive Report  
to accompany  
HYDROGRAPHIC SURVEY H11641  
PROJECT: OPR-L430-NRT6-10  
Scale of Survey: 1:10,000  
Year of Survey: 2010  
NOAA Navigation Response Team 6  
Eric Moore, Laura Pagano and Ed Wernicke

## **A. AREA SURVEYED**

This survey was conducted in accordance with Hydrographic Survey Letter Instructions for Survey H11641, San Francisco Bay, CA. The original instructions are dated May 7<sup>th</sup>, 2010. Data acquisition was conducted from May 25<sup>th</sup>, 2010 through January 12, 2011.

Project Instructions specify complete coverage, which was achieved in most areas using 200% side scan sonar with concurrent multibeam. Coverage requirements for areas too shallow or close to shore for towing side scan sonar were not specified in the project instructions, so object detection multibeam was acquired in these areas not covered by side scan but seaward of the NALL line. Object detection coverage was acquired over all developments and AWOIS items. Please see figure 4 for an image depicting object detection multibeam coverage.

An area south of the survey area north of the Richmond Bridge was found to have extensive shoaling. The 12, 18, and 30 ft contours on the eastern shore have migrated far to the west. An area south of the designated survey area near the Navy piers was developed with SWMB in order to more accurately chart these changes.<sup>1</sup> Please see figure 5 below for coverage of this area.

See Table 1 and figures 1-7 below for acquisition totals, images of survey limits and data coverage.

Multibeam (mainscheme)	314 LNM
Side Scan Sonar 100% (mainscheme)	161 LNM
Side Scan Sonar 200% (mainscheme)	158 LNM
Crosslines	16.5 LNM
Development/Holidays/CSF/AWOIS	34.1 LNM
Square Nautical Miles	6.1 SNM

Table 1: NOAA Survey Launch S3003 Acquisition Totals

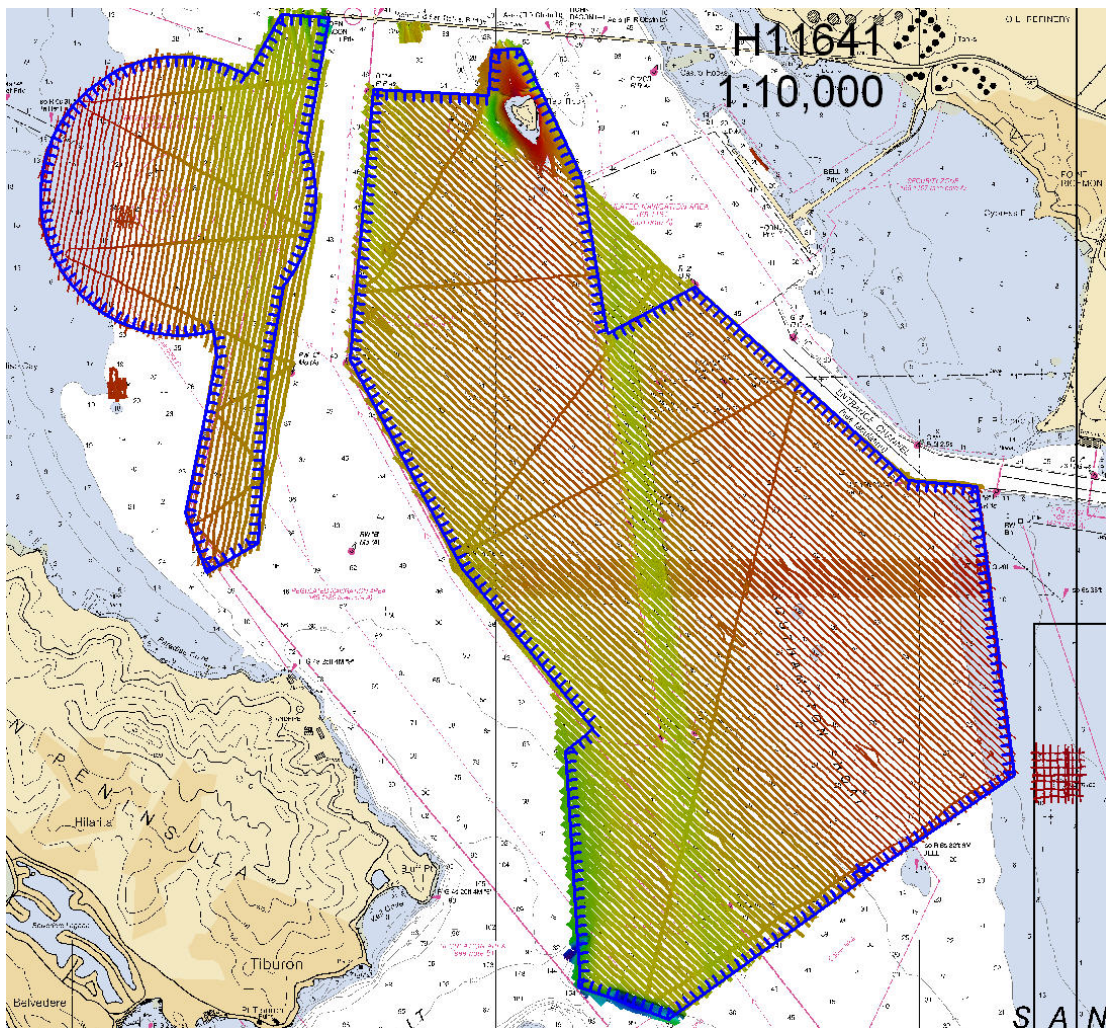


Figure 1: San Francisco Bay, Sheet D, multibeam sonar data coverage.



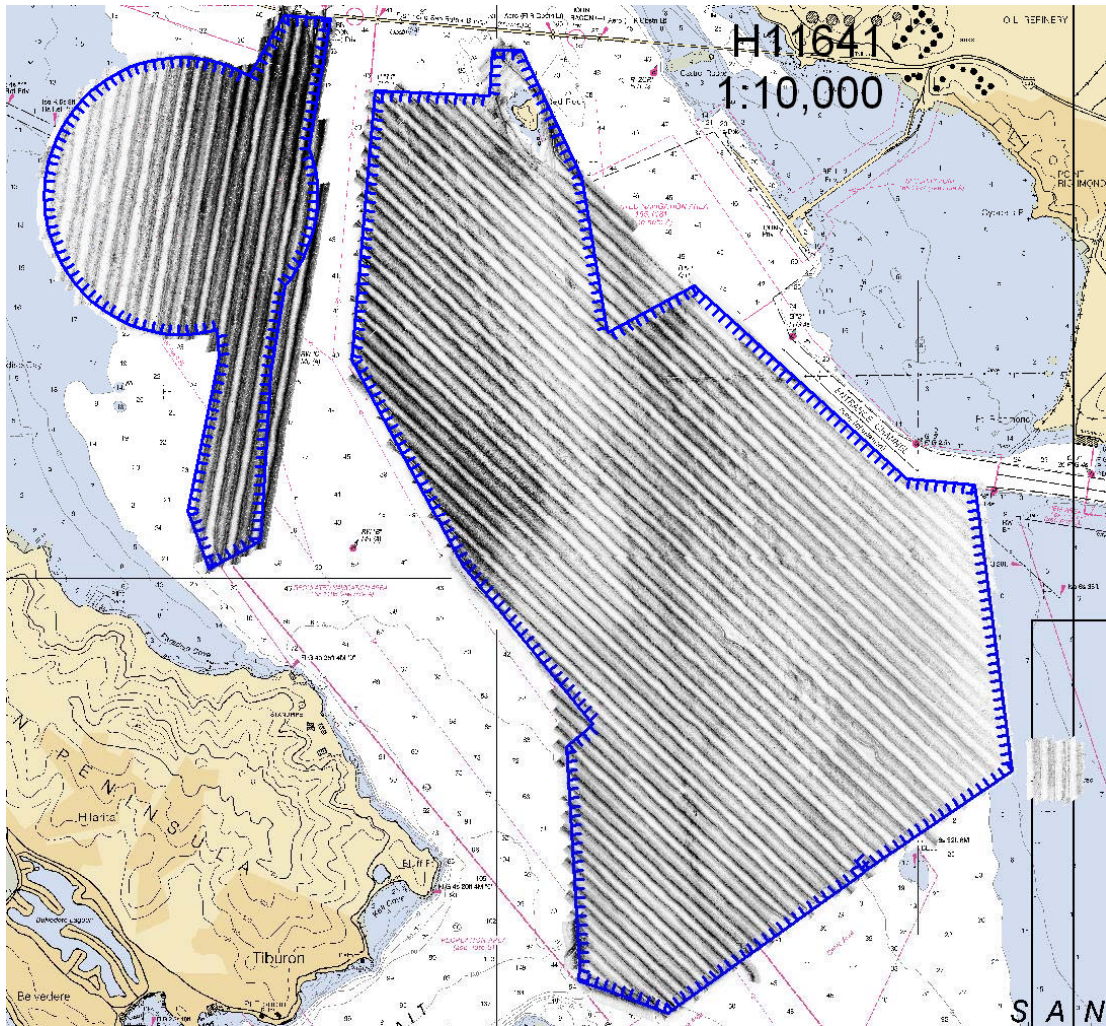


Figure 2: San Francisco Bay, Sheet D, 100% side scan sonar data coverage.

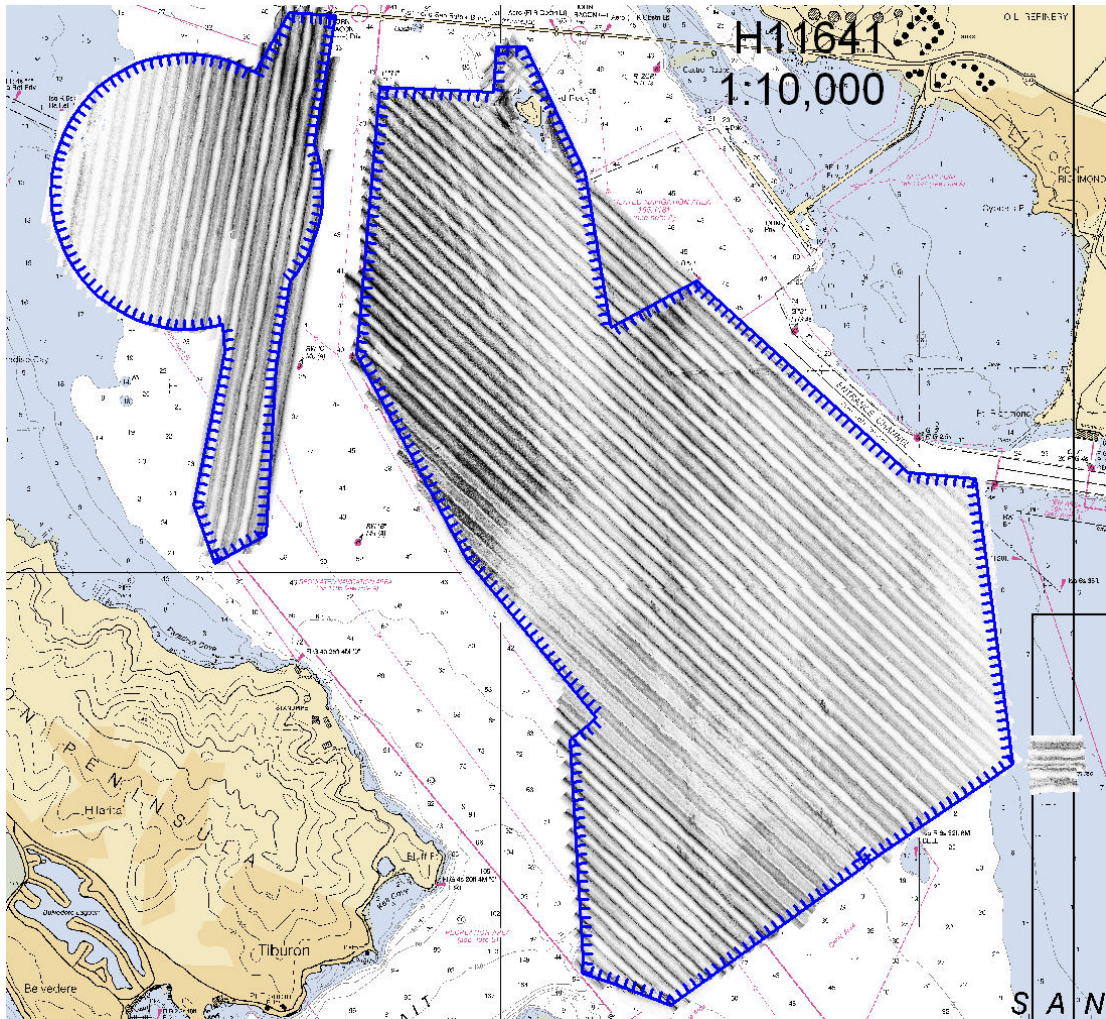


Figure 3: San Francisco Bay, Sheet D, 200% side scan sonar data coverage.



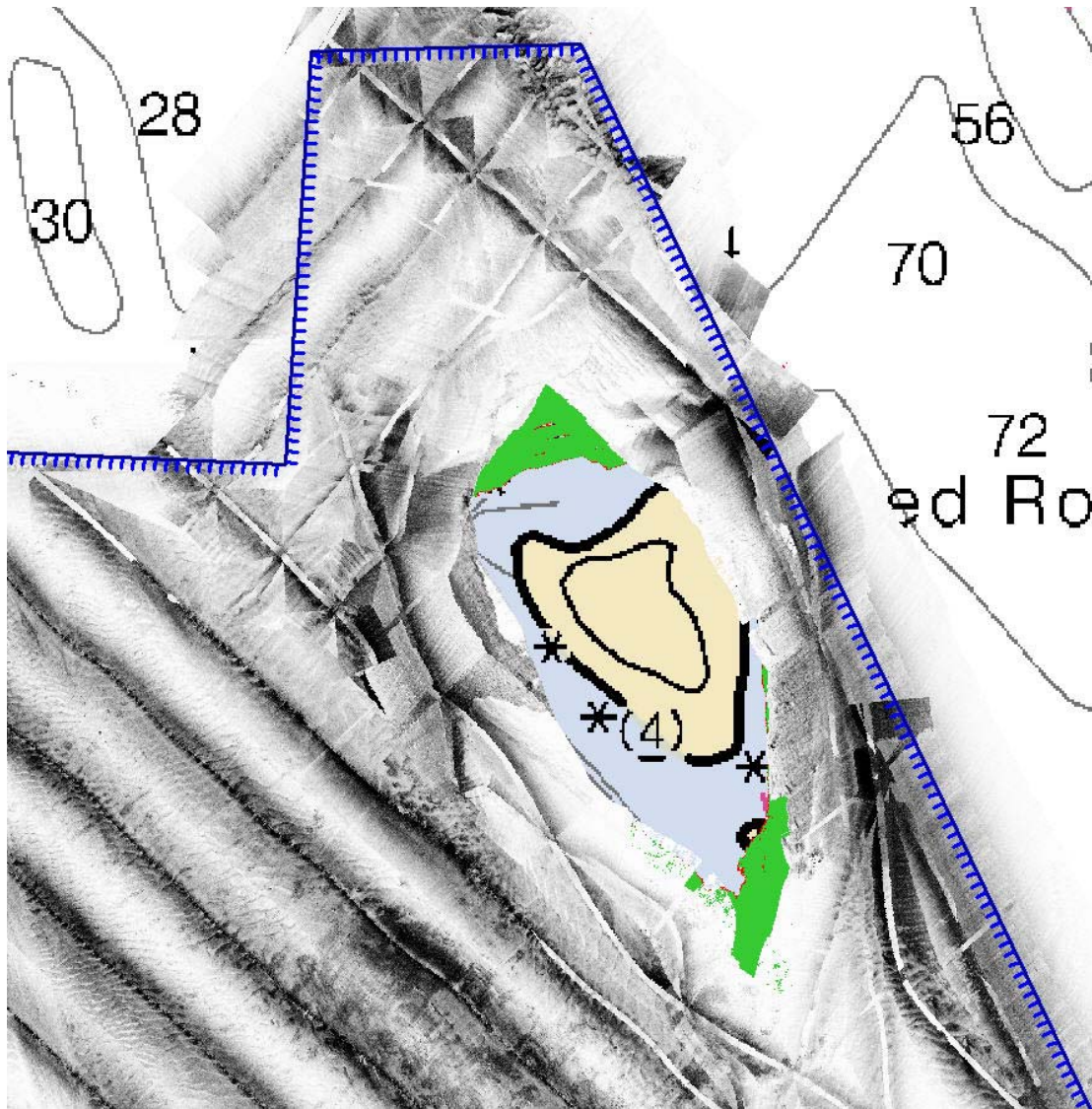


Figure 4: Object detection coverage of 5 soundings per node was acquired where towfish operations were not possible, to the NALL. Areas with a density of five soundings per node or greater are shown in green, less than five are in red.









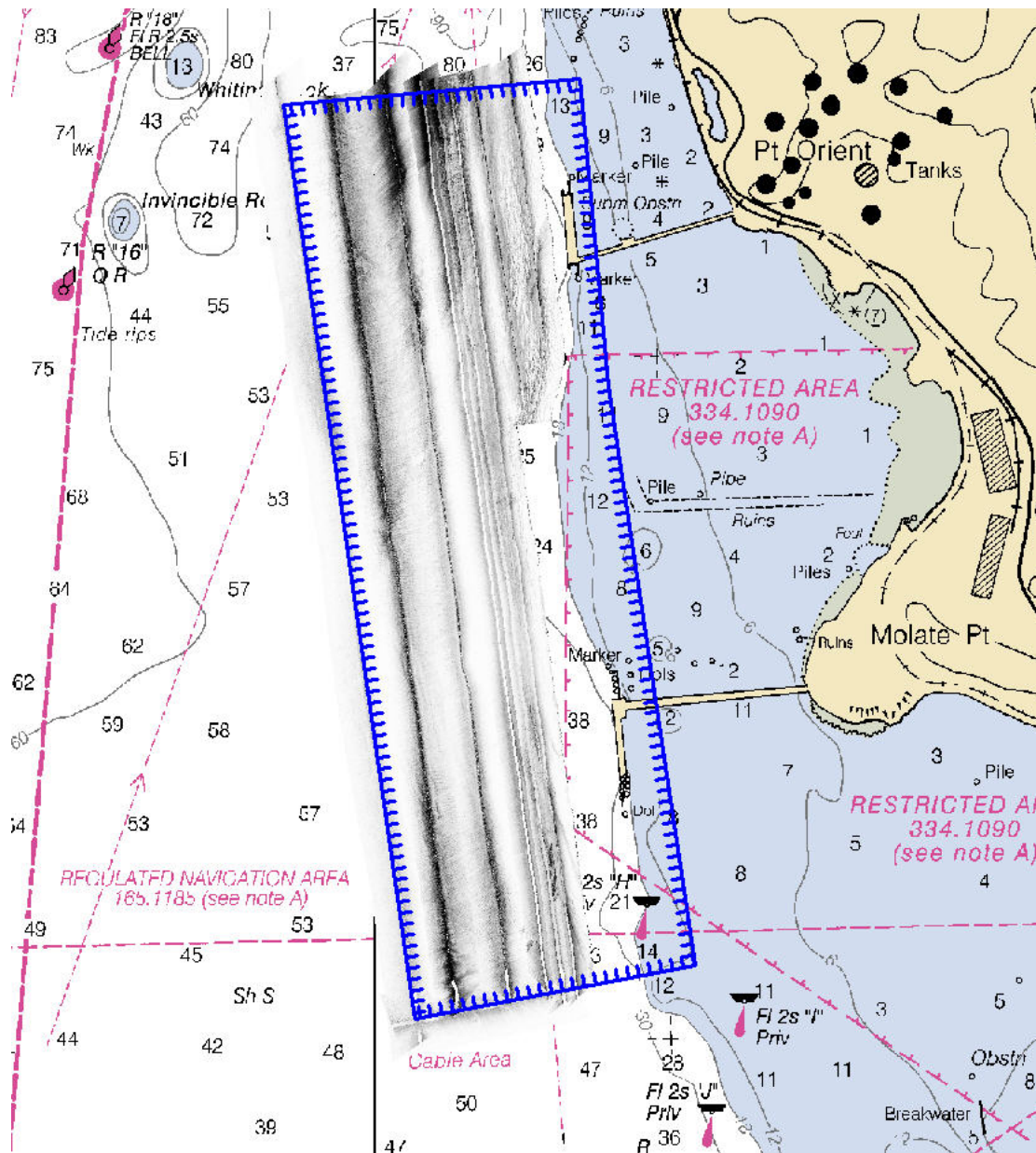


Figure 7: San Francisco Bay Inset survey area, Sheet D, 200% side scan sonar data coverage

## B. DATA ACQUISITION AND PROCESSING

### B.1 EQUIPMENT

Data were acquired by NOAA Survey boat S3003, which is a 10-meter hydrographic survey vessel with a transducer draft of 0.507 meters (-.024m from reference to

waterline, .483m from reference to multibeam transducer).

NOAA Survey boat S3003 acquired soundings, imagery, and sound velocity profiles. Soundings and imagery were acquired by SIMRAD EM3000 multibeam echosounder. Imagery was acquired with a Klein 3000 side scan sonar. Water column sound velocity data was acquired with a Sea-Bird SBE 19+ CTD.

NOAA Survey boat S3003 positioning and attitude data were determined with an Applanix POS/MV 320 Version 4 GPS-aided inertial navigation system.

Refer to the Data Acquisition and Processing Report (DAPR) for detailed equipment and vessel configuration information.

## **B.2 QUALITY CONTROL**

### **B.2.1 Side Scan Sonar Quality Control**

Daily confidence checks were made by observing the outer ranges of the side scan sonar images. A good check consisted of distinguishing contacts corresponding to charted features such as navigational Fixed Aids and other cultural features across the entire range of the side scan trace.

### **B.2.2 Shallow Water Multibeam Quality Control**

A filter was used to eliminate soundings greater than 45° from nadir in the main survey area and anchorage area. This eliminated many of the artifacts caused by the outerbeams. Please note the pier inset in the north was not filtered, as additional coverage was needed, and the area was shallow enough to prevent outer beam related artifacts.

It was noted that in certain locations in the survey area, a vertical offset approximately 15-20 cm exists between days of SWMB data. These areas were much localized, and may be due to an unconstrained tidal difference, sediment shifting, or other factors. That these offsets were not seen throughout the survey area suggest

that the error is not systematic in nature, but a random error.<sup>2</sup> Please see the figures below for further clarification.

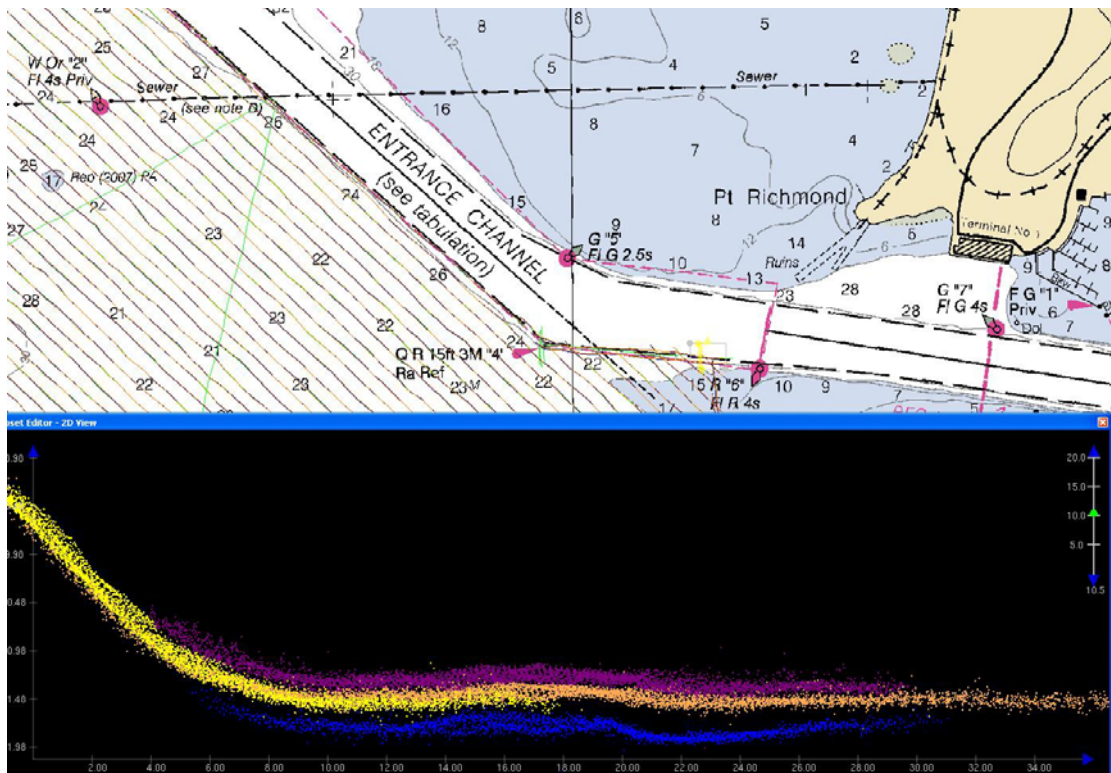


Figure 8: Image of an area just outside the Richmond harbor jetty, demonstrating the largest vertical offset found during processing.

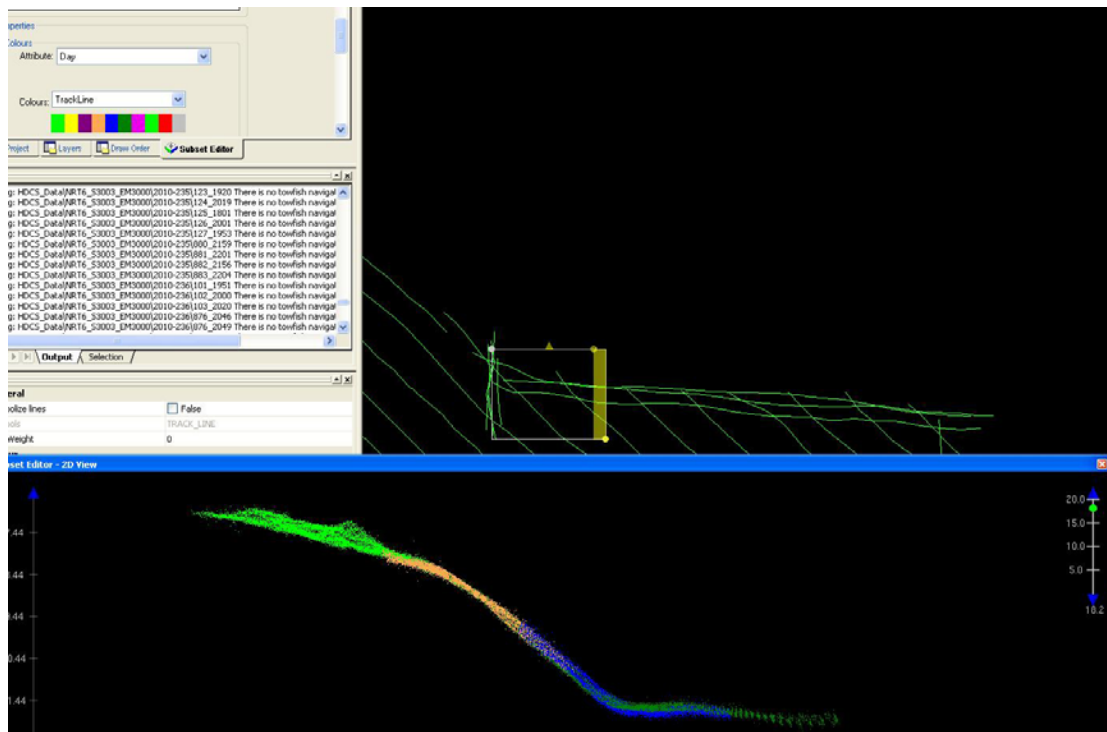


Figure 9: Image of SWMB data located near the previous area, including several of the lines from the previous image. Vertical offset is minimal between lines of different days.

Refer to this project’s DAPR and HSRR for detailed discussion of SWMB system calibrations, data acquisition, and data processing.

### B.2.3 BASE Surfaces

One CARIS HIPS BASE (*Bathymetry Associated with Statistical Error*) surface, which incorporates each sounding’s total propagated uncertainty (TPU), was created. The finalized BASE surface contains eight layers: depth, uncertainty, density, mean, standard deviation, hypothesis strength, hypothesis count and user nominated. Refer to this project’s DAPR for detailed discussion of BASE surface generation and processing.

The following Field sheet was generated as part of this survey<sup>3</sup>:

Table 2: Fieldsheets, BASE Surfaces created.

<b><u>Fieldsheet</u></b>	<b><u>#BASE Surfaces</u></b>	<b><u>Resolution</u></b>	<b><u>Purpose</u></b>
H11641	2	0.5m	Coverage & Finalized

### **B.2.4 Crosslines**

A total of 314 lnm of mainscheme lines were planned and approximately 16.5 lnm of crosslines were conducted, totaling more than 5% of the planned survey lines. BASE surfaces were examined and no systematic errors in the SWMB system were found.

### **B.3 CORRECTIONS TO ECHO SOUNDING**

All methods or instruments used are detailed in the project DAPR. A table of all sound velocity casts is located in Separate II. Sound velocity casts are taken in local Pacific Time.

### **B.4 COMPOSITE SOURCE FILE**

NRT6 received a Composite Source File with the survey package in 2009. The intention is to verify the items listed in the CSF, in the field. Selected CSF items were verified in the field either visually, using SSS, or SWMB. The CSF items were then addressed in the Pydro PSS. A Composite Source File Feature Report, exported from the PSS, is located in Appendix 5 of the DR. Also located in Appendix 5 are the original CSF file, CSF pictures, and the acquisition sheets. Please see the DAPR for detailed CSF procedures and notes.<sup>4</sup>

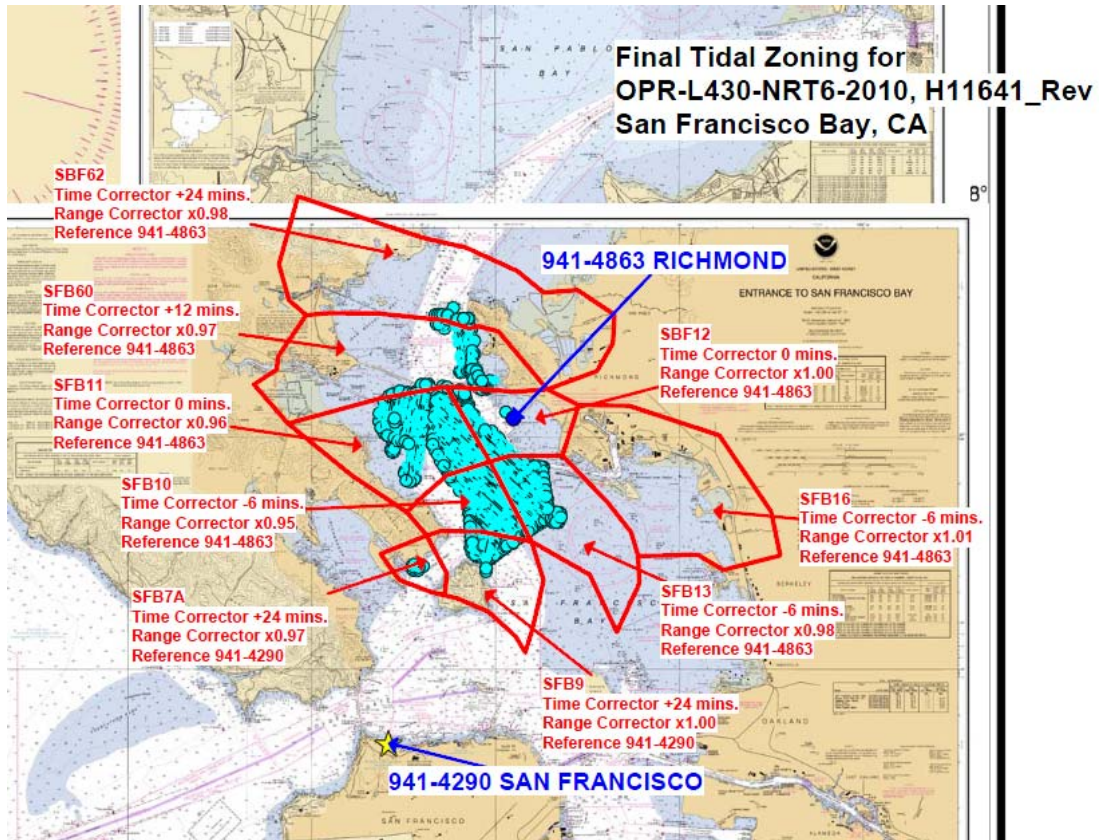
## **C. VERTICAL AND HORIZONTAL CONTROL**

### **C.1 VERTICAL CONTROL**

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at Richmond, CA (941-4863) and San Francisco, CA (941-4290) were the water level stations for this project. See Figure 9 for station locations and tide zone boundaries. The tide zoning



file “H11641CORF” was applied during processing. The uncertainty value of .13m was used for the TPE computation in CARIS.



**Figure 9: Final Tidal Zoning**

The final zones and correctors used for this survey are as follows:

**Table 1: Final Tide Zones & Correctors**

<b><u>Zone Name</u></b>	<b><u>Time Correctors (mins)</u></b>	<b><u>Range Ratio</u></b>	<b><u>Predicted Reference</u></b>
SFB7A	+24	X0.97	941-4290
SFB9	+24	X1.00	941-4290
SFB10	-6	X0.95	941-4863
SFB11	0	X0.96	941-4863
SBF12	0	X1.00	941-4863
SFB13	-6	X0.98	941-4863
SFB16	-6	X1.01	941-4863
SFB60	+12	X0.97	941-4863

SBF62	+24	X0.98	941-4863
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An original request for final tides was sent to N/OPS1 on September 30<sup>th</sup>, 2010 but after a more thorough analysis of the post processed data, it was decided that NRT6 would extend the survey area over a shoal to update the chart accurately. Therefore a revised final tides request was sent to N/OPS1 on January 21<sup>st</sup>, 2011 to account for the additional days at sea.<sup>5</sup> Observed water levels from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data with preliminary tide zoning. Refer to the 2010 DAPR for a summary of the methods used to determine, evaluate, and apply tide corrections to sounding data.

## **C.2 HORIZONTAL CONTROL**

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 10.

Horizontal position was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon station at Pigeon Pt, CA (287 kHz). No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored daily. The observed HDOP values did not exceed 4.00.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1 CHART COMPARISON**

Data accuracy standards and bottom coverage requirements have been met and survey data for survey H11641 are adequate to supersede charted data in their common areas.

There are four raster charts affected by this survey and one ENC cell covering the survey area:

Table 3: Affected Charts

<u>Chart Number</u>	<u>Edition</u>	<u>Edition Date</u>
18649	67 <sup>th</sup>	12/01/2009
18652 SC	35 <sup>th</sup>	08/01/2009
18653	11 <sup>th</sup>	10/01/2009
18654	44 <sup>th</sup>	01/01/2008

<u>ENC Cell</u>	<u>Last Updated</u>
US5CA21M	10/29/2010

### **D.1.1 General Agreement with Charted Soundings**

Depths from survey H11641 generally agree with depths on chart 18653, with the exception of the contour lines that need to be slightly shifted and repositioned to reflect new survey data. The most apparent and dramatic sounding shifts that have taken place are shown in the figures below. Sounding recommendations and images are included in the Pydro PSS and the survey feature report located in Appendix II.<sup>6</sup>



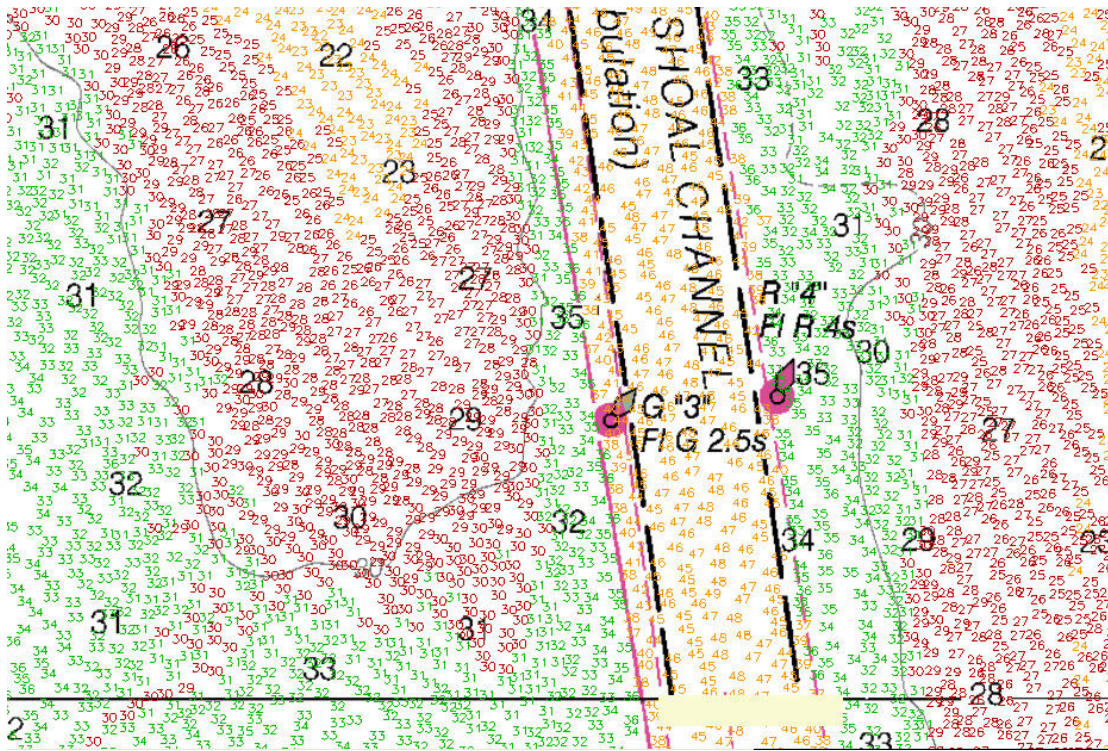


Figure 10: In general, the updated soundings and contours agree with the current chart within a few feet. In the main survey area, the 30ft contour needs to be shifted accordingly to the new survey data.<sup>7</sup>

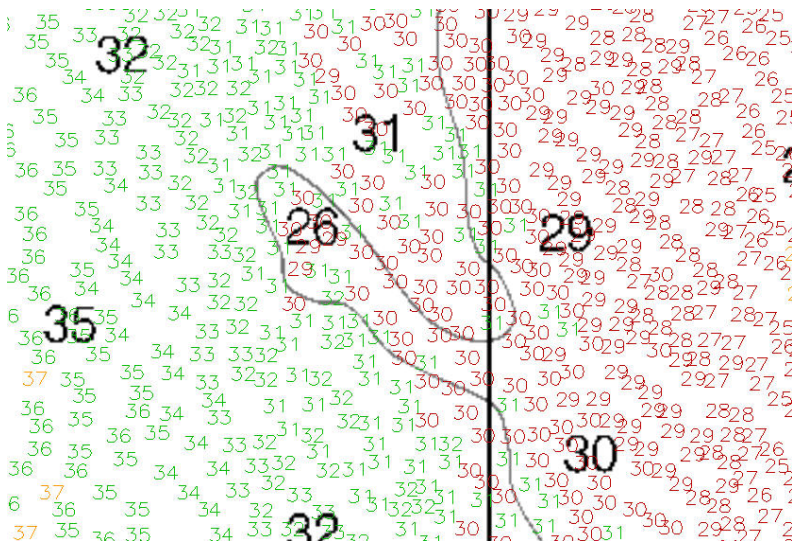


Figure 11: This area is located slightly NW of the main area indicated above in figure 10. It shows a 26ft sounding that is outdated and both the sounding and contours should be updated to reflect changes.<sup>8</sup>

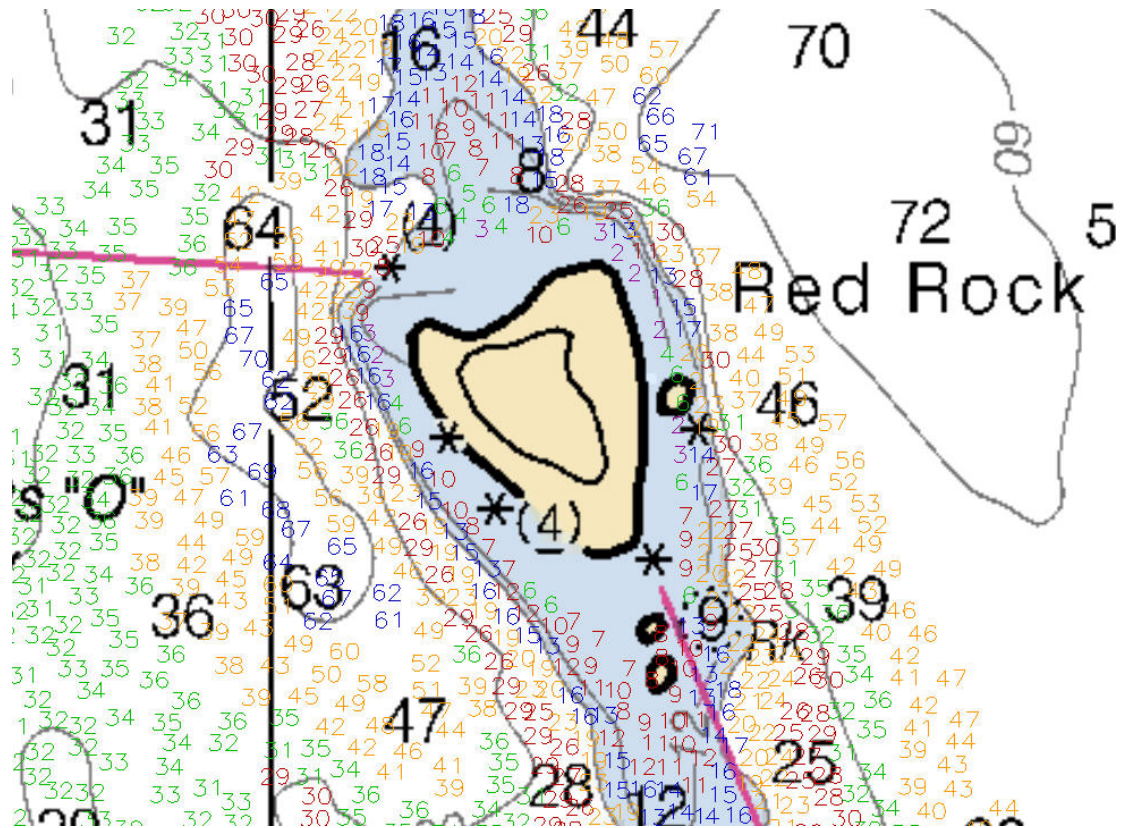


Figure 12: Red Rock is located in the NE portion of the main survey area. A few areas of contour shifts are notable but in general the data matches up well considering this is an extremely dynamic region. The most obvious update would be to shift the 60ft contour on the west side of Red Rock and update the position of the 64ft charted sounding. Please refer to the PSS for other charting modifications and recommendations in this area that were noted.<sup>9</sup>



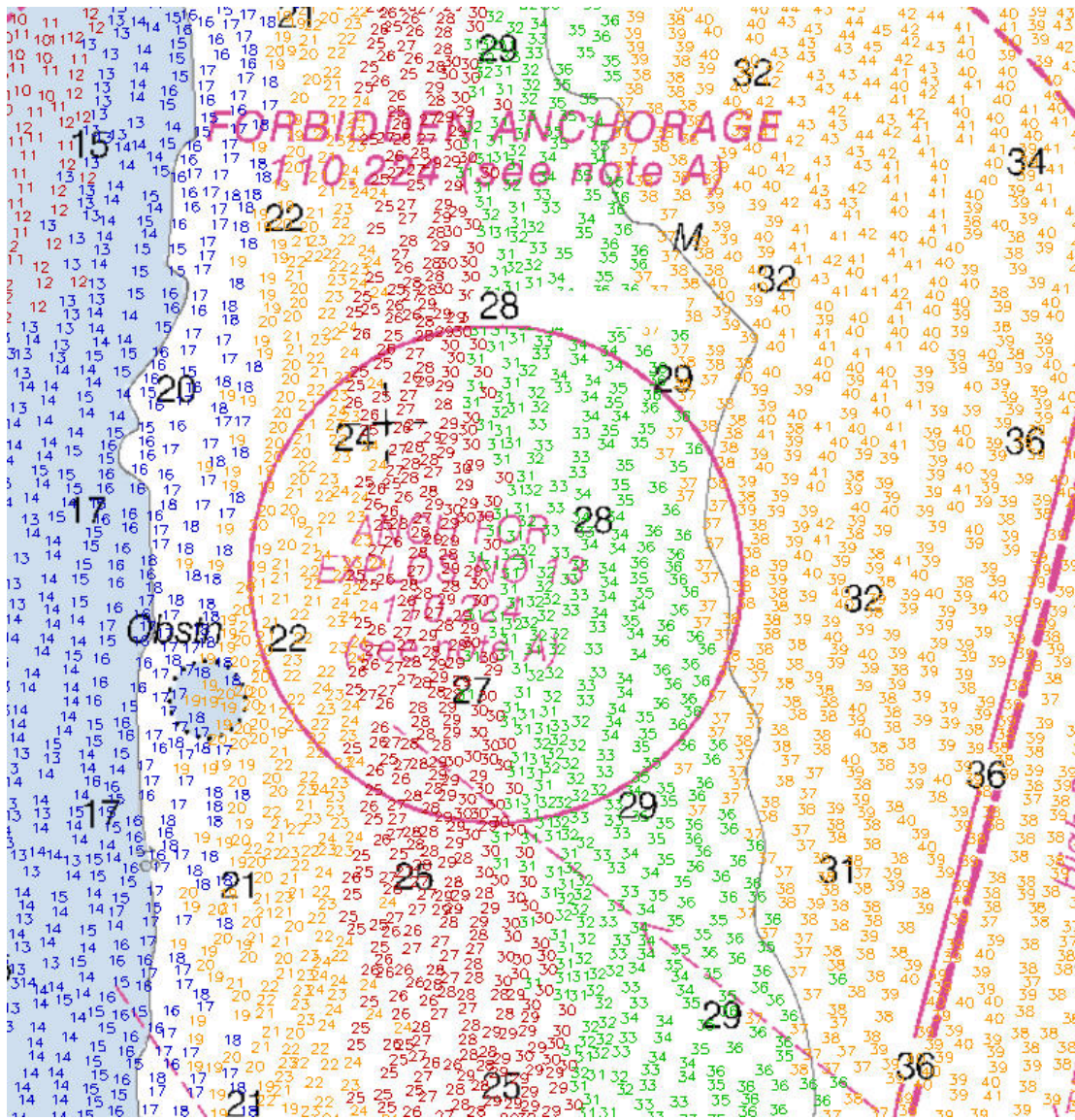


Figure 13: Soundings and contours in the forbidden anchorage need to be shifted accordingly to reflect new survey data. As seen here, the 18ft contour needs to be shifted east and the 30ft contour needs to be shifted significantly west.<sup>10</sup>



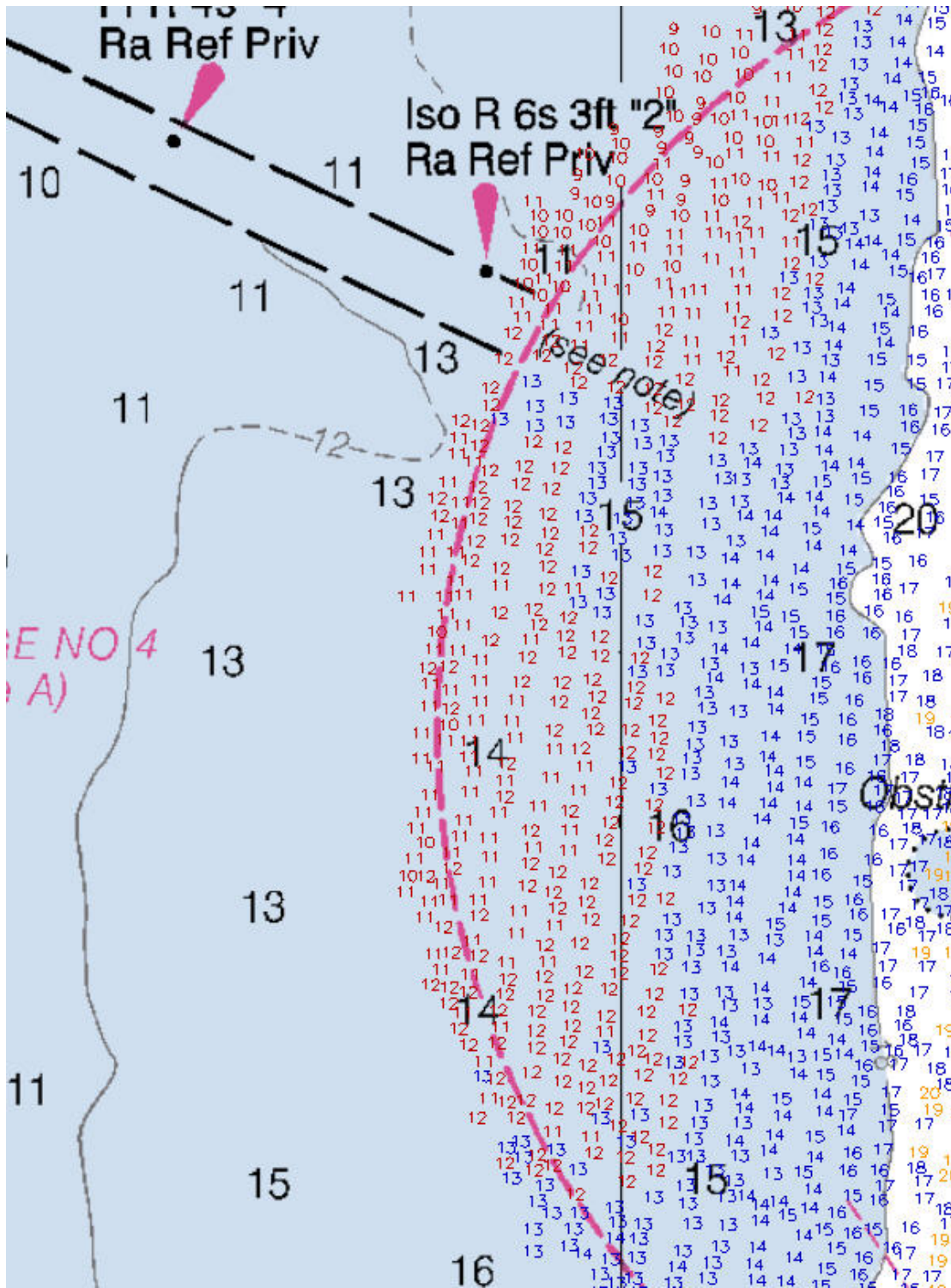


Figure 14: The 12ft contour in the forbidden anchorage area also needs to be shifted to the east.

11

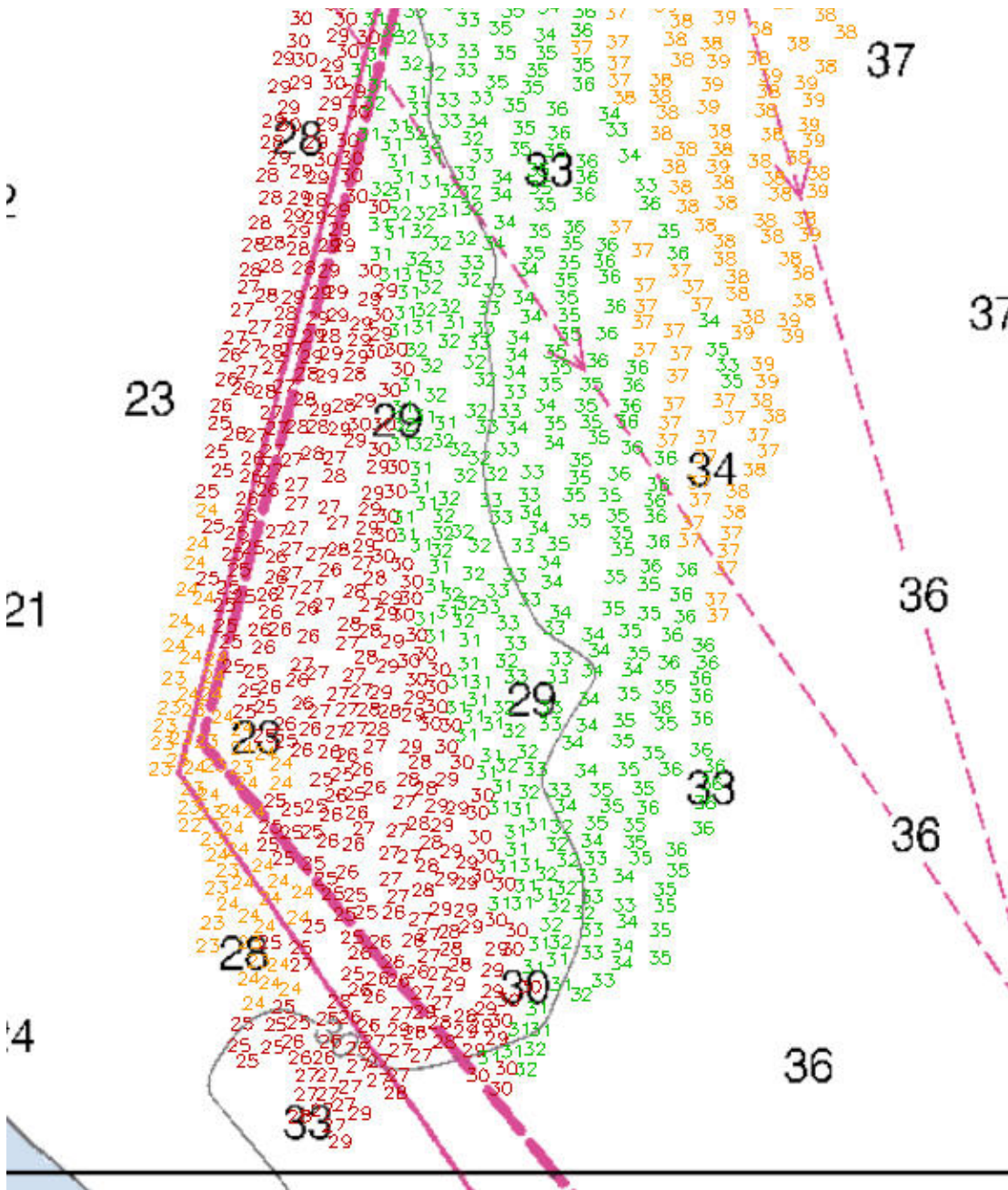


Figure 15: The 30ft contour in the southern portion of the forbidden anchorage area needs to be shifted west and the soundings should be updated and repositioned accordingly. <sup>12</sup>



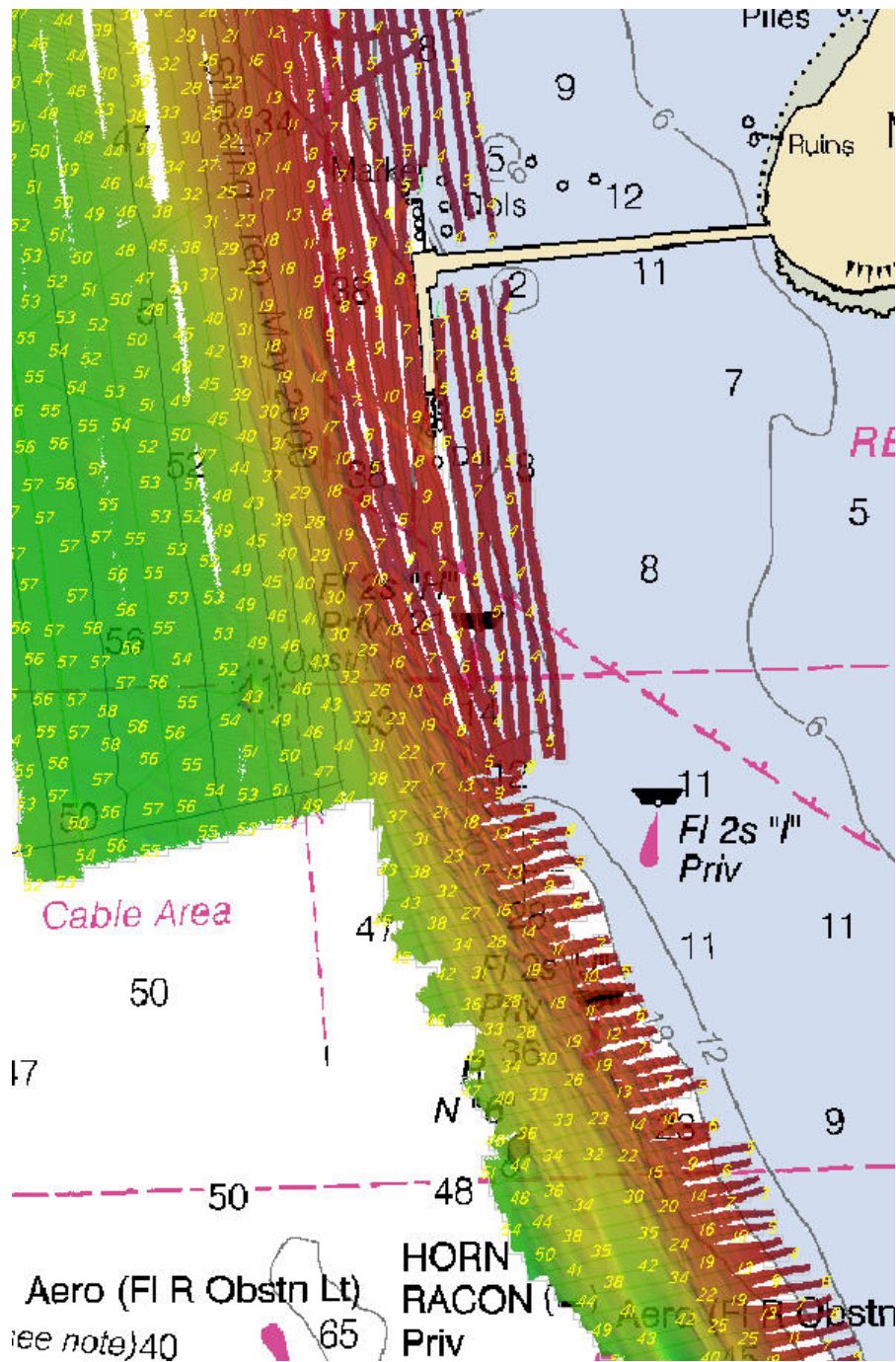


Figure 16: The inset area north of the main survey was found to have extensive shoaling. The 12, 18, and 30 ft contours on the eastern shore have migrated far to the west. An area south of the designated survey was developed with SWMB in order to more accurately chart these changes. This is the most notable and dramatic shift in the entire survey and most soundings and contours are affected and will need to be updated. <sup>13</sup>

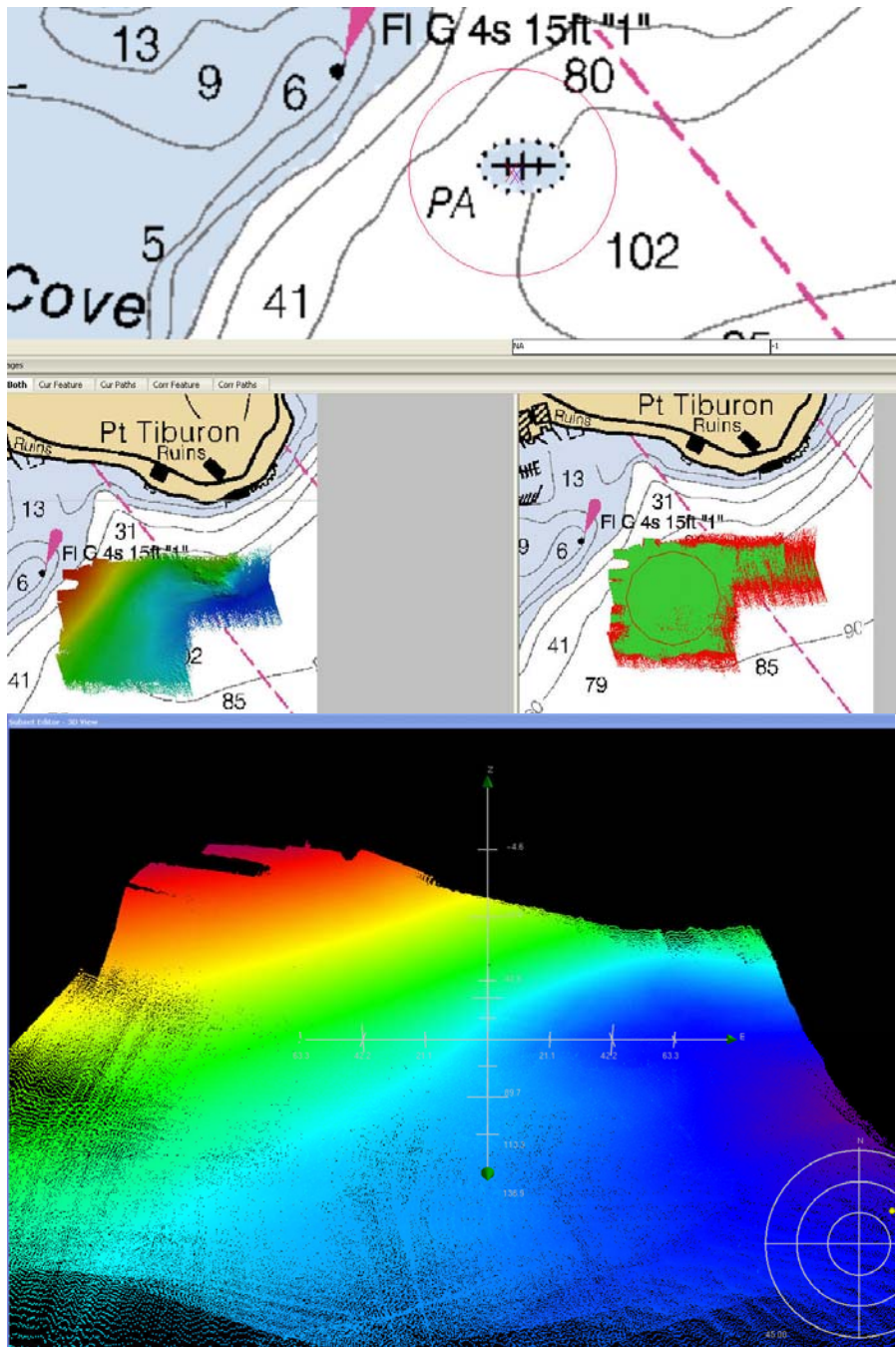


Figure 17: Disproval of AWOIS 52719. The AWOIS database states that a vessel sank in 60ft of water in the area shown above. NRT6 completed the coverage requirements for the search radius and found no evidence of a wreck. The hydrographer in charge recommends removing the PA wreck symbol from the chart. Investigation methods, results and charting recommendations have been entered into the Pydro PSS “H11641.pss”.<sup>14</sup>



### **D.1.2 Dangers to Navigation (Dtons)**

No DTON's were identified by the field party within the limits of H11641.<sup>15</sup>

### **D.1.3 AWOIS Items**

Eleven AWOIS items were assigned and 14 investigated during this survey. Investigation methods, results and charting recommendations have been entered into the Pydro PSS "H11641.pss". Information pertaining to the AWOIS items is contained in Appendix II of this report.<sup>16</sup>

## **D.2 ADDITIONAL RESULTS**

### **D.2.1 Prior Surveys**

No prior surveys were listed for comparison in the project instructions.

### **D.2.2 Aids to Navigation and Other Detached Positions**

No aids to navigation or other detached positions were acquired for this survey.

### **D.2.3 Bridges and Overhead Cables**

No bridges or overhead cables were located within the survey limits of H11641.

### **D.2.4 Ferry Routes**

High speed ferry routes run through the survey area and are addressed with Note "F" on the chart. There no ferry terminals within the survey area of Sheet H11641.

### **D.2.5 Submarine Cables and Pipelines**

One charted sewer line was verified in the survey area and is shown in the figure below.<sup>17</sup>



## E. APPROVAL SHEET

**OPR-L430-NRT6-10**  
**San Francisco Bay, California**  
**Survey Registry No. H11641**

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All bathymetry models, this Descriptive Report, and all accompanying records and data are approved.


This survey is adequate to supersede all prior surveys in common areas and for application to the relevant NOS nautical charts.

Also submitted in association with this descriptive report has been a series of reports and data:

- SEPARATES TO ACCOMPANY PROJECT OPR-L430-NRT6-10
- OPR-L430-NRT6-10 HORIZONTAL AND VERTICAL CONTROL REPORT
- 2010 DATA ACQUISITION AND PROCESSING REPORT

Respectfully Submitted:

Approved and Forwarded:

**Laura  
Pagano**  Digitally signed by  
Laura Pagano  
Date: 2011.05.11  
13:00:54 -07'00'

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Laura Pagano, NOAA  
Physical Science Technician  
Acting Team Leader, NRT6



## **Revisions Compiled During Office Processing and Certification**

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- <sup>1</sup> Chart soundings and features in accordance with HCell. Updated Contours are included in the H11641\_SS.000 file
- <sup>2</sup> Survey Data is adequate to supersede charted data within the common area.
- <sup>3</sup> The following office finalized surfaces were used for Compilation:  
H11641\_50cm\_SAR\_Final.
- <sup>4</sup> Chart features in accordance with the HCell.
- <sup>5</sup> Tide note received 04/06/2011. The final tide note is appended to this report.
- <sup>6</sup> Concur with clarification. Chart soundings and features in accordance with HCell.
- <sup>7</sup> Updated Contours are included in the H11641\_SS.000 file.
- <sup>8</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>9</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>10</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>11</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>12</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>13</sup> Chart per HCell. Updated Contours are included in the H11641\_SS.000 file.
- <sup>14</sup> See attached features report. Recommendations to remove have been bluenoted in the HCell.
- <sup>15</sup> Do not concur, three DTONs were identified during office compilation and submitted to MCD. See attached report.
- <sup>16</sup> AWOIS report is appended to this report. Chart per HCell.
- <sup>17</sup> Retain pipeline as charted.
- <sup>18</sup> Chart one new bottom sample in accordance with HCell. Charted bottom samples have been bluenoted retain or remove in the HCell.

# H11641\_Dton\_Report

**Registry Number:** H11641  
**State:** California  
**Locality:** San Francisco Bay  
**Sub-locality:** Raccoon Strait to Point San Pablo  
**Project Number:** OPR-L430-NRT6-10  
**Survey Date:** 01/12/2011

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18653	11th	10/01/2009	1:20,000 (18653_1)	USCG LNM: 5/10/2011 (6/21/2011) NGA NTM: 6/2/2007 (7/2/2011)
18649	66th	02/01/2009	1:40,000 (18649_1)	[L]NTM: ?
18652	34th	09/01/2007	1:80,000 (18652_6)	[L]NTM: ?
18645	26th	09/01/2008	1:100,000 (18645_1)	[L]NTM: ?
18640	25th	08/01/2005	1:207,840 (18640_1)	[L]NTM: ?
18680	31st	06/01/2005	1:210,668 (18680_1)	[L]NTM: ?
18010	21st	03/01/2007	1:811,980 (18010_1)	[L]NTM: ?
18022	35th	08/01/2005	1:868,003 (18022_1)	[L]NTM: ?
18007	33rd	02/01/2009	1:1,200,000 (18007_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

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	1.93 m	37° 56' 54.1" N	122° 25' 42.4" W	---
1.2	Shoal	1.98 m	37° 56' 41.9" N	122° 25' 40.8" W	---
1.3	Shoal	1.32 m	37° 56' 36.9" N	122° 25' 38.5" W	---

# **1 - Dangers To Navigation**



## 1.1) GP No. - 02260003F2280001/1 from H11641 / Compilation / Working / dtons2.000

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 37° 56' 54.1" N, 122° 25' 42.4" W  
**Least Depth:** 1.93 m (= 6.32 ft = 1.053 fm = 1 fm 0.32 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2011-012.00:00:00.000 (01/12/2011)  
**GP Dataset:** H11641 / Compilation / Working / dtons2.000  
**GP No.:** 02260003F2280001/1  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Shoal sounding.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
H11641/Compilation/Working/dtons2.000	02260003F2280001/1	0.00	000.0	Primary

#### Hydrographer Recommendations

Chart new sounding

#### Cartographically-Rounded Depth (Affected Charts):

6ft (18653\_1, 18649\_1, 18652\_6)

1fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

1.9m (501\_1, 50\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** SORDAT - 20110112  
 SORIND - US,US,graph,H11641

### Feature Images

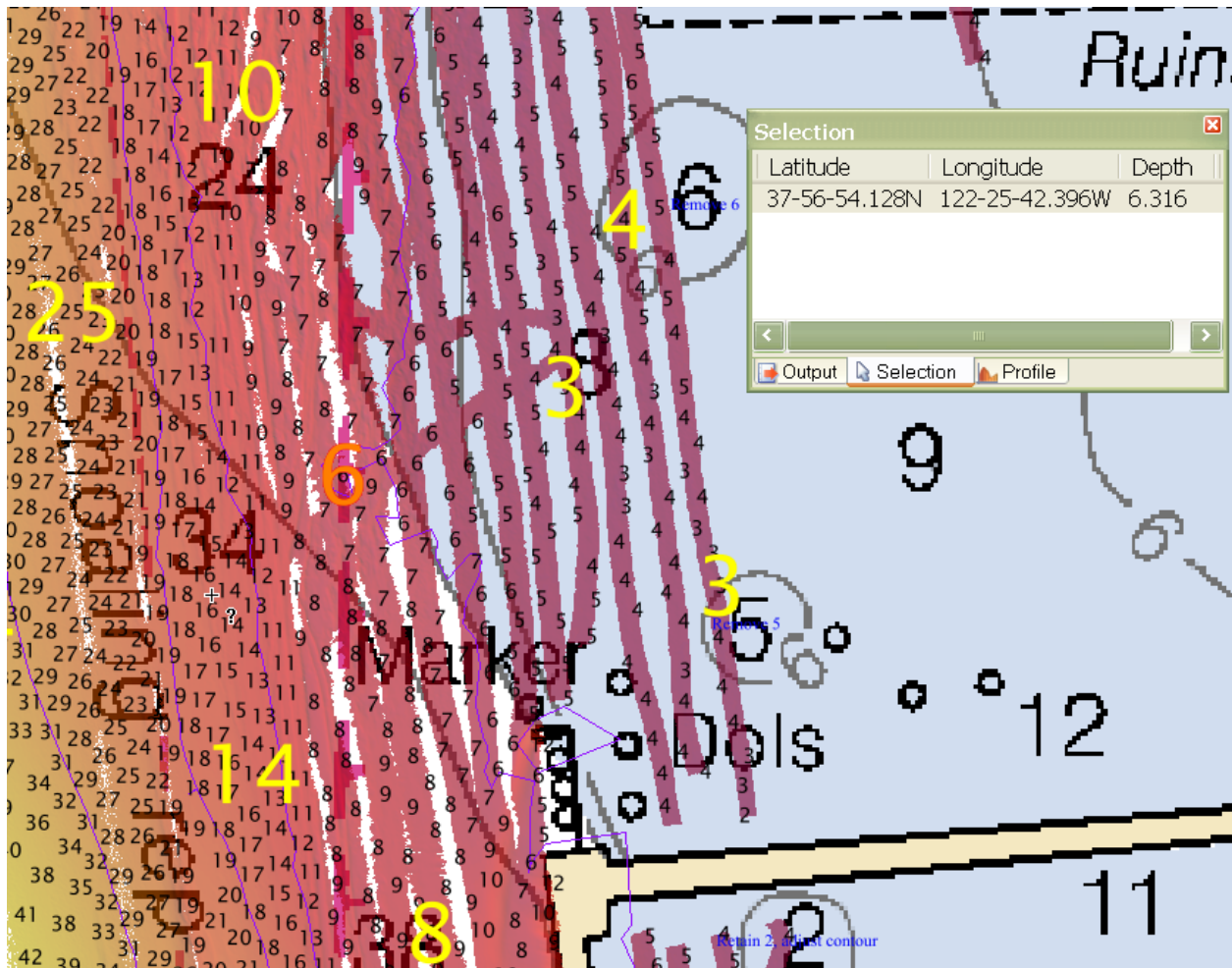


Figure 1.1.1

## 1.2) GP No. - 02260003F62E0001/1 from H11641 / Compilation / Working / dtons2.000

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 37° 56' 41.9" N, 122° 25' 40.8" W  
**Least Depth:** 1.98 m (= 6.51 ft = 1.084 fm = 1 fm 0.51 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2011-012.00:00:00.000 (01/12/2011)  
**GP Dataset:** H11641 / Compilation / Working / dtons2.000  
**GP No.:** 02260003F62E0001/1  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Shoal sounding.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
H11641/Compilation/Working/dtons2.000	02260003F62E0001/1	0.00	000.0	Primary

#### Hydrographer Recommendations

Chart new sounding

#### Cartographically-Rounded Depth (Affected Charts):

6ft (18653\_1, 18649\_1, 18652\_6)

1fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

2.0m (501\_1, 50\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** SORDAT - 20110112  
 SORIND - US,US,graph,H11641



### Feature Images

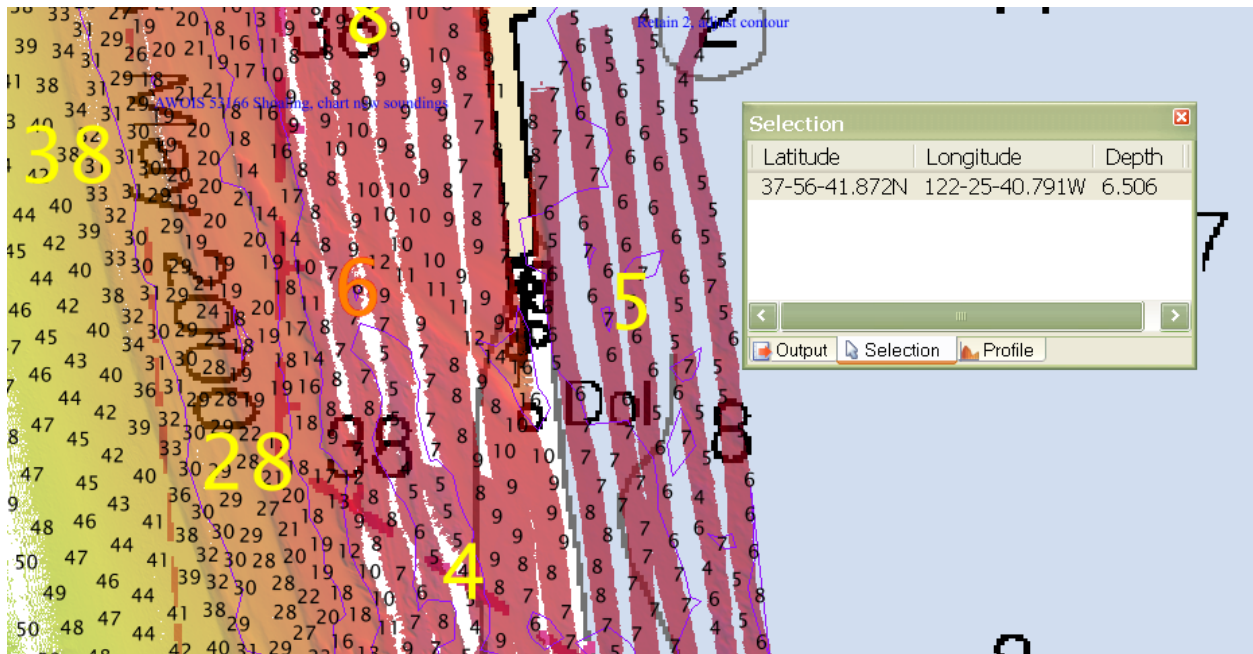


Figure 1.2.1

**1.3) GP No. - 02260003F3520001/1 from H11641 / Compilation / Working / dtons2.000**

**DANGER TO NAVIGATION**

**Survey Summary**

**Survey Position:** 37° 56' 36.9" N, 122° 25' 38.5" W  
**Least Depth:** 1.32 m (= 4.32 ft = 0.721 fm = 0 fm 4.32 ft)  
**TPU (±1.96σ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2011-012.00:00:00.000 (01/12/2011)  
**GP Dataset:** H11641 / Compilation / Working / dtons2.000  
**GP No.:** 02260003F3520001/1  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

Shoal sounding.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
H11641/Compilation/Working/dtons2.000	02260003F3520001/1	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart new sounding

**Cartographically-Rounded Depth (Affected Charts):**

4ft (18653\_1, 18649\_1, 18652\_6)  
 0 ¾fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)  
 1.3m (501\_1, 50\_1)

**S-57 Data**

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** SORDAT - 20110112  
 SORIND - US,US,graph,H11641

### Feature Images

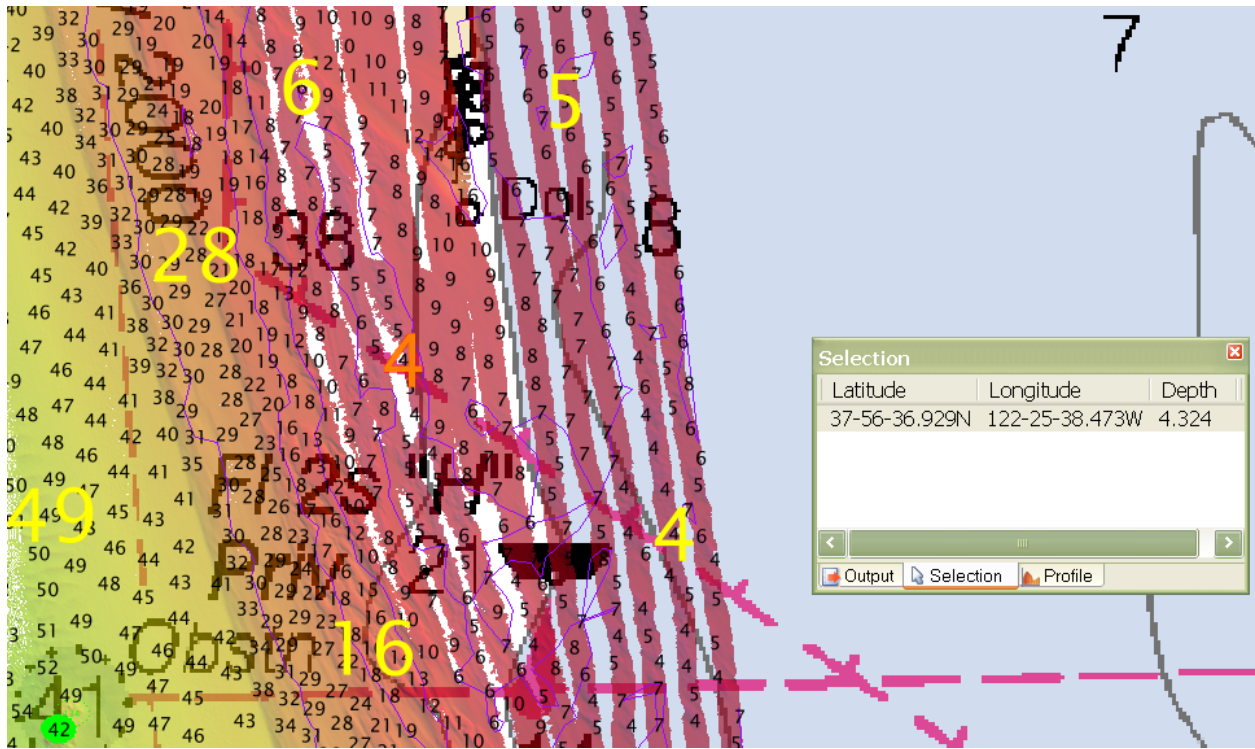


Figure 1.3.1



# H11641 AWOIS Report

**Registry Number:** H11641  
**State:** California  
**Locality:** San Francisco Bay  
**Sub-locality:** Raccoon Strait to Point San Pablo  
**Project Number:** OPR-L430-NRT6-10  
**Survey Dates:** 5/25/2010 - 1/12/2011

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18653	11th	10/01/2009	1:20,000 (18653_1)	USCG LNM: 5/10/2011 (6/21/2011) NGA NTM: 6/2/2007 (7/2/2011)
18654	44th	01/01/2008	1:40,000 (18654_1)	[L]NTM: ?
18652	34th	09/01/2007	1:80,000 (18652_6) 1:80,000 (18652_1) 1:40,000 (18652_5)	[L]NTM: ?
18649	66th	02/01/2009	1:40,000 (18649_1)	[L]NTM: ?
18645	26th	09/01/2008	1:100,000 (18645_1)	[L]NTM: ?
18640	25th	08/01/2005	1:207,840 (18640_1)	[L]NTM: ?
18680	31st	06/01/2005	1:210,668 (18680_1)	[L]NTM: ?
18010	21st	03/01/2007	1:811,980 (18010_1)	[L]NTM: ?
18022	35th	08/01/2005	1:868,003 (18022_1)	[L]NTM: ?
18007	33rd	02/01/2009	1:1,200,000 (18007_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
AWOIS	[no data]	[no data]	[no data]

AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
AWOIS	[no data]	[no data]	[no data]
Wreck	21.73 m	37° 57' 28.8" N	122° 26' 28.4" W
Obstruction	12.81 m	37° 56' 30.3" N	122° 25' 46.4" W
Wreck	4.92 m	37° 54' 43.7" N	122° 27' 47.7" W
Wreck	15.61 m	37° 52' 09.4" N	122° 25' 15.2" W
Shoal	2.88 m	37° 55' 39.4" N	122° 25' 46.3" W
Wreck	1.36 m	37° 53' 16.0" N	122° 23' 17.8" W

**1 - DR\_AWOIS**



## 1.1) AWOIS #50525 - AWOIS 50525

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 57' 58.8" N, 122° 25' 11.0" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

#### History Notes:

##### HISTORY

CL967/76--CAS18649 (1976)-OPR-511-DA76, ITEM 9; WRECK, VISIBLE, POS. LATITUDE 37-57-58.3N, LONG. 122-25-09.1W. MINIRANGER POS.

TP00526(1977-78,79)--REVIEWED; WRECK, UNCOVERS 6 FT AT MLLW. POS.(SCALED 1:20,000) LAT. 37-57-58.8N, LONG. 122-25-07.8W, SEXTANT

H10080/83-OPR-L123-RA-83; VISIBLE WK, UNCOVERS 5FT AT MLLW, LOCATED AT LAT. 37-57-59.1N, LONG. 122-25-07.1W. (UPDATED 2/85 RWD)

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18654\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Informational Awois Only.

### Hydrographer Recommendations

Did not see. Too shallow for survey ops to verify. Retain as charted.

## 1.2) AWOIS #50526 - AWOIS 50526

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 57' 53.1" N, 122° 25' 09.4" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

#### History Notes:

HISTORY

H7867/50--CS256; LIMIT LINE ANNOTATED "BREAKWATER OF GROUNDED HULLS". OFFSHORE LIMIT SCALED AT 1:10,000, LAT. 37-57-54.5N, LONG. 122-25-00.0N.

CL967/76--CAS18649 (1976)-OPR-511-DA76, ITEM 8; WRECK, VISIBLE POS. LAT. 37-57-53.4N, LONG. 122-25-05.5W. MINIRANGER POSITION.

H10080/83--OPR-L123-RA-83; RECOMMENDS CHART WK AS UNCOVERING AT MLLW. VISUALLY VERIFIED. RETAIN CHARTED WK.

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18654\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Informational Awois Only.

### Hydrographer Recommendations

Did not see. Too shallow for survey ops to verify. Retain as charted.

### 1.3) AWOIS #50527 - AWOIS 50527

#### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 57' 54.8" N, 122° 25' 03.8" W  
**Historical Depth:** [None]  
**Search Radius:** 0  
**Search Technique:** [None]  
**Technique Notes:** [None]

#### History Notes:

HISTORY

H7867/50--CS256; LIMIT LINE ANNOTATED "BREAKWATER OF GROUNDED HULLS". OFFSHORE LIMIT SCALED AT 1:10,000, LAT. 37-57-54.5N, LONG. 122-25-00.0N.

CL967/76--CAS18654(1976)-OPR-511-DA76, ITEM 8; WRECK, VISIBLE POS. LATITUDE 37-57-55.4N, LONGITUDE 122-24-59.2W. MINIRANGER POS.

H10080/83--OPR-L123-RA-83; RECOMMENDS CHART PRESENT SURVEY DATA.

(UPDATED 2/85 RWD)

#### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18654\_1, 18652\_6, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Informational Awois Only.

#### Hydrographer Recommendations

Did not see. Too shallow for survey ops to verify. Retain as charted.

## 1.4) AWOIS #53765 - Awois: Obstruction

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 55' 06.5" N, 122° 26' 17.3" W  
**Historical Depth:** [None]  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

LNM36/02-11TH CG; submerged obstruction has been reported in Anchorage 5 in San Francisco Bay in position 37-55-06.480N, 122-26-17.340W. (ENTERED 4/09 KAK)

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Submerged obstruction has been reported in Anchorage 5 in San Francisco Bay.

### Hydrographer Recommendations

Disproved using 200% SSS coverage with concurrent MB. Recommend deleting obstruction off the chart.



## 1.5) AWOIS #52719 - Awois 52719 - PA Wreck

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 52' 11.5" N, 122° 27' 10.0" W  
**Historical Depth:** [None]  
**Search Radius:** 100  
**Search Technique:** S2,MB,ES  
**Technique Notes:** CONDUCT A SEARCH 75M OUT FROM AN AXIS BETWEEN 37-52-07.4 N 122-27-17.7 W AND 37-52-15.7 N 122-27-07.4 W

#### History Notes:

##### HISTORY

LNM36/83--12TH GGD, 9/9/83; THE M/V SHADOW SUNK IN 60 FT OF WATER 300 YARDS OFF THE CORINTHIAN YACHT CLUB MARINA. A DREDGING PIPE THE SHADOW WAS WORKING WITH SUNK IN THE SAME POSITION.

F00477/01--OPR-L430-NRB; LOCATED IN 80 FEET OF WATER WITH EBB STRONG CURRENT - NOT INVESTIGATED. UPDATED 11/03 MCR

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18652\_5, 18652\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

PA Wreck

### Hydrographer Recommendations

Filled search radius with coverage requirements and did not see any signs of wreckage. Hydrographer recommends deleting this PA wreck off of the chart.

## 1.6) AWOIS #53165 - UNKNOWN

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 57' 31.7" N, 122° 26' 31.9" W  
**Historical Depth:** 15.24 m  
**Search Radius:** 150  
**Search Technique:** MB,ES,S2  
**Technique Notes:** [None]

#### History Notes:

L-346/53; SAN PABLO STRAIT-WRECK- LIGHTED BUOY DISCONTINUED. BARGE WRECK- LIGHTED BUOY WR6 HAS BEEN DISCONTINUED. APPROX. POSITION: 37°57'32"N 122°26'28"W (NAD27). NOTE.- THE CORPS OF ENGINEERS ADVISES THAT THE AREA HAS BEEN SWEEPED TO A DEPTH OF 50 FEET MLLW.

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18654\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

L-346/53; SAN PABLO STRAIT-WRECK- LIGHTED BUOY DISCONTINUED. BARGE WRECK- LIGHTED BUOY WR6 HAS BEEN DISCONTINUED. APPROX. POSITION: 37°57'32"N 122°26'28"W (NAD27). NOTE.- THE CORPS OF ENGINEERS ADVISES THAT THE AREA HAS BEEN SWEEPED TO A DEPTH OF 50 FEET MLLW.

### Hydrographer Recommendations

Not visible in survey data. Near by AWOIS 50736 exists.

## 1.7) AWOIS #53166 - Awois 53166 - shoaling

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 56' 47.0" N, 122° 25' 40.0" W  
**Historical Depth:** [None]  
**Search Radius:** 200  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

L-778/00--5/19/2000; THE SHOALING IS UP TO TWENTY FEET LESS THAN CHARTED DEPTHS IN THE AREA OF 37°56'47"N 122°25'40"W. THE AREA IS JUST NORTH OF THE RICHMOND-SAN RAFAEL BRIDGE IN THE SAN FRANCISCO-SAN PABLO BAY REGION OF CALIFORNIA. THE SOUNDINGS HAVE BEEN CORRECTED BUT NOT VERIFIED SO THE CHART CORRECTION SHOULD PROBABLY BE A LEGEND OF "SHOALING REPORTED MAY 2000" ALONG THE LENGTH OF THE SOUNDINGS OR A FEW INDIVIDUAL "SHOALING REPORTED TO 16 FT MAY 2000" TYPE LEGENDS IN A FEW PLACES.

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Awois search radius was assigned to update depths and confirm shoaling reported in this area.

### Hydrographer Recommendations

Hydrographer highly recommends updating and modifying the chart in this area to reflect new survey data. The survey area was extended beyond survey limits with SWMB sonar to completely cover the shoal. This was completed to ensure the contour lines and soundings could be updated accurately. Please refer to base the surface and chart comparison as well for updates in this entire area.

No designated soundings were picked for the search radius since the entire area is shoaling. S57 attributes for this Awois search radius may need to be modified.

## 1.8) AWOIS #53766 - Awois: Obstruction

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 37° 56' 03.5" N, 122° 26' 23.6" W  
**Historical Depth:** 11.89 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

H10962 - OPR-L304-KR-99 : An obstruction was found to be 7 feet above the seafloor, with a depth of 39 feet. The obstruction is 25 feet in length and may be a steel girder. (ENTERED 4/09 KAK)

### Survey Summary

**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Possible obstruction.

### Hydrographer Recommendations

After searching the area with SWMB, no large obstruction was visible. Most likely this obstruction was removed. Hydrographer recommends removing this feature from the chart.



## 1.9) Profile/Beam - 454/32 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-215 / 661\_1822

### Primary Feature for AWOIS Item #50736

**Search Position:** 37° 57' 28.9" N, 122° 26' 28.5" W  
**Historical Depth:** 22.56 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** SEARCH NOT REQUIRED INSHORE OF THE 60 FT DEPTH CONTOUR

#### History Notes:

##### HISTORY

NM4/52--OIL BARGE SUNK IN LAT.37-57-32N, LONG.122-26-28W IN 85FT OF WATER.

NM15/53--COE; 50FT SWEPT AREA (MLLW) IN LAT 37-57-32N, LONG.122-26-28W (PA).

NOTHING FOUND.

CL346/53--SAME AS NM15/53.

H9811/79--OPR-L123-DA-79; WK NOT INVESTIGATED, NOT COVERED BY MAINSCHEME

HYDROGRAPHY. (UPDATED 2/87 RWD).

FE302/87--OPR-L123-PHP-87; WK NOT INVESTIGATED, PHP INDICATES DIVING TO DANGEROUS, RECOMMENDS SSS. (UPDATED 8/88 RWD).

H10480/93--SUBM WRECK NOT LOCATED WITH ECHOSOUNDER INVESTIGATION AT 10M NS AND 12M EW LINESPACING. SSS WAS NOT USED. RECOMMEND RETAIN CHARTED 50FT CLEARANCE DEPTH. (UPDATED 3/95 RWD)

F00477/01--OPR-L430-NRB; THE WRECKED BARGE WAS CLEARLY VISIBLE ON THE SONARGRAM. THE CONTACTS WERE FULLY DEVELOPED; THE BARGE LIMITS WERE DEFINED AND THE LEAST DEPTH OF 74 FEET (22.5 METERS) WAS FOUND AT THE ABOVE LOCATION (POS. NO. 17659). DELETE 50 FOOT SUBMERGED WRECK, CHART SUBMERGED WRECK WITH A LEAST DEPTH OF 74 FEET AT LATITUDE 37/57/28.915N, LONGITUDE 122/26/28.500W. UPDATED 9/03 MCR

### Survey Summary

**Survey Position:** 37° 57' 28.8" N, 122° 26' 28.4" W  
**Least Depth:** 21.73 m (= 71.29 ft = 11.882 fm = 11 fm 5.29 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.969$  m ; TVU (TPEv)  $\pm 0.312$  m  
**Timestamp:** 2010-215.18:31:43.127 (08/03/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-215 / 661\_1822  
**Profile/Beam:** 454/32

**Charts Affected:** 18653\_1, 18649\_1, 18654\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

**Remarks:**

SUBMERGED WRECK WITH A LEAST DEPTH OF 74 FEET AT LATITUDE 37/57/28.915N,  
LONGITUDE 122/26/28.500W. UPDATED 9/03 MCR

## Hydrographer Recommendations

Verified wreck. Hydrographer recommends modifying the charted sounding from 74ft to 71ft to reflect updated survey data.

**Cartographically-Rounded Depth (Affected Charts):**

71ft (18653\_1, 18649\_1, 18654\_1, 18652\_6)

12fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

22m (501\_1, 50\_1)

## 1.10) Profile/Beam - 803/89 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-217 / 902\_1919

### Primary Feature for AWOIS Item #53169

**Search Position:** 37° 56' 30.5" N, 122° 25' 46.0" W  
**Historical Depth:** 12.50 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

L-1270/00--8/8/00; POSITION COMES FROM PROJECT NUMBER OPR-L304-KR-99: DAVID EVANS AND ASSOCIATES HYDROGRAPHIC SURVEY DANGER TO NAVIGATION REPORT. OBJECT DISCOVERED WAS AN OBSTRUCTION. DEBRIS WAS FOUND TO BE 9.0 FEET ABOVE THE SEA FLOOR. A LEAST DEPTH WAS OBTAINED FROM BEAM # 77. USING SMOOTHED OBSERVED TIDES, A DEPTH OF 41.6 FEET BELOW MLLW WAS COMPUTED FROM MULTIBEAM DATA. THE CHARTED DEPTH IN THIS AREA IS 46 FEET. IT IS RECOMMENDED IN THE DESCRIPTIVE REPORT THAT DIVE INVESTIGATIONS BE PERFORMED TO VERIFY LEAST DEPTHS B/C IT IS POSSIBLE THAT MASTS OR OTHER OBSTRUCTIONS COULD BE RISING ABOVE THIS FEATURE

LNM 34/00-- 8/22/00; ADD 41 FT SOUNDING WITH DANGER CURVE AND BLUE TINT, LABEL: OBSTN AT 37°56'30.5"N 122°25'46.00"W.

### Survey Summary

**Survey Position:** 37° 56' 30.3" N, 122° 25' 46.4" W  
**Least Depth:** 12.81 m (= 42.03 ft = 7.005 fm = 7 fm 0.03 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.963$  m ; TVU (TPEv)  $\pm 0.292$  m  
**Timestamp:** 2010-217.19:28:54.031 (08/05/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-217 / 902\_1919  
**Profile/Beam:** 803/89  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

(Chtd Awois Obstr 53169) Rock pile.

## Hydrographer Recommendations

Verified obstruction. Update chart with 42ft obstn sounding to reflect new survey data.

### **Cartographically-Rounded Depth (Affected Charts):**

42ft (18653\_1, 18649\_1, 18652\_6)

7fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

12.8m (501\_1, 50\_1)



## 1.11) Profile/Beam - 597/106 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-222 / 600\_1850

### Primary Feature for AWOIS Item #53175

**Search Position:** 37° 54' 43.2" N, 122° 27' 47.5" W  
**Historical Depth:** 4.27 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

OPR-L304-KR-99 (H-10962): PACIFIC HYDROGRAPHIC BRANCH DANGER TO NAVIGATION REPORT. AN UNCHARTED WRECK WAS LOCATED 3300 FEET OFF PARADISE CAY IN TIBURON, CA. THE WRECK RISES 4.7 FEET OFF THE SEAFLOOR AND MULTIBEAM SONAR DETECTED THE LEAST DEPTH AS 13.9 FEET BELOW MLLW. THE WRECK IS APPROXIMATELY 60 FEET IN LENGTH. THE CHARTED DEPTH IN THIS AREA IS 19 FEET. THE WRECK IS CHARTED AT 37°54'43.2"N 122°27'47.5"W WITH A DEPTH OF 14 FEET. IT IS RECOMMENDED IN THE DESCRIPTIVE REPORT THAT DIVE INVESTIGATIONS BE PERFORMED TO VERIFY LEAST DEPTHS B/C IT IS POSSIBLE THAT MASTS OR OTHER OBSTRUCTIONS COULD BE RISING ABOVE THIS FEATURE

### Survey Summary

**Survey Position:** 37° 54' 43.7" N, 122° 27' 47.7" W  
**Least Depth:** 4.92 m (= 16.15 ft = 2.691 fm = 2 fm 4.15 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.962$  m ; TVU (TPEv)  $\pm 0.284$  m  
**Timestamp:** 2010-222.18:58:36.800 (08/10/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-222 / 600\_1850  
**Profile/Beam:** 597/106  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Awois wreck 53175 investigated and verified.

## Hydrographer Recommendations

Recommend modifying charted sounding from 14ft to 16ft to reflect new survey data.

### **Cartographically-Rounded Depth (Affected Charts):**

16ft (18653\_1, 18649\_1, 18652\_6)

2 ¾fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

4.9m (501\_1, 50\_1)

## 1.12) Profile/Beam - 160/96 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-222 / 618\_1815

### Primary Feature for AWOIS Item #51672

**Search Position:** 37° 52' 08.8" N, 122° 25' 15.3" W  
**Historical Depth:** 16.76 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

HISTORY

BP49005--USN SURVEY 1952; DANG SUBM WRECK REPORTED IN LAT 37-52-09N, LONG 122-25-11W.

H9793/78--OPR-L123-RA-78; DANG SUBM WRECK WAS LOCATED IN LAT 37-52-08.5N, LONG 122-25-11.4W. A 10M SPACING FATHOMETER DEV WAS RUN AND A 55FT DEPTH WAS ACQUIRED. A LEAST DEPTH WAS NOT DETERMINED. (ENT 8/87 RWD).

H10471/93--WRECK (SUBM 16.7M (55FT) AT MLLW) WAS NOT ADEQUATELY DEVELOPED FOR LD. A 5M ECHOSOUNDER WITH NO SS, NOT CONSIDERED ADEQUATE FOR DISPROVAL. A 17.1M DEPTH WAS FOUND IN VICINITY. (UPDATED 3/95 RWD)

H10962/02 -- OPR-L304-KR-99; WRECK WAS FOUND AT POSITION 37-52-08.816N, 122-25-15.259 W WITH A LEAST DEPTH OF 55.5 FEET. EVALUATOR RECOMMENDS CHARTING 55 FT WRECK. (ENT. 12/17/04, JRS)

### Survey Summary

**Survey Position:** 37° 52' 09.4" N, 122° 25' 15.2" W  
**Least Depth:** 15.61 m (= 51.21 ft = 8.535 fm = 8 fm 3.21 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.965$  m ; TVU (TPEv)  $\pm 0.299$  m  
**Timestamp:** 2010-222.18:23:21.860 (08/10/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-222 / 618\_1815  
**Profile/Beam:** 160/96  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_5, 18652\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Verified wreck. AWOIS 51672.

## Hydrographer Recommendations

Verified wreck. Would recommend updating the location of wreck and change the least depth from 55ft to 51ft to reflect new MB survey data.

**Cartographically-Rounded Depth (Affected Charts):**

51ft (18653\_1, 18649\_1, 18652\_5, 18652\_1, 18652\_6)

8 ½fm (18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

15.6m (501\_1, 50\_1)



## 1.13) Profile/Beam - 2237/63 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-223 / 808\_1942

### Primary Feature for AWOIS Item #53173

**Search Position:** 37° 55' 39.5" N, 122° 25' 46.2" W  
**Historical Depth:** 2.74 m  
**Search Radius:** 50  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

OPR-L304-KR-99 (H-10962): PACIFIC HYDROGRAPHIC BRANCH DANGER TO NAVIGATION REPORT. UNCHARTED ROCK WAS FOUND, DURING SURVEY, 270 FEET SOUTHEAST OF RED ROCK ISLAND. MULTIBEAM SONAR DETECTED THE LEAST DEPTH AS 9.5 FEET AT MLLW. ROCK IS CHARTED AS HAVING A DEPTH OF 9 FEET. IT IS RECOMMENDED IN THE DESCRIPTIVE REPORT THAT DIVE INVESTIGATIONS BE PERFORMED TO VERIFY LEAST DEPTHS B/C IT IS POSSIBLE THAT MASTS OR OTHER OBSTRUCTIONS COULD BE RISING ABOVE THIS FEATURE.

### Survey Summary

**Survey Position:** 37° 55' 39.4" N, 122° 25' 46.3" W  
**Least Depth:** 2.88 m (= 9.45 ft = 1.575 fm = 1 fm 3.45 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.960$  m ; TVU (TPEv)  $\pm 0.283$  m  
**Timestamp:** 2010-223.19:53:23.768 (08/11/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-223 / 808\_1942  
**Profile/Beam:** 2237/63  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_6, 18645\_1, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

rock

### Hydrographer Recommendations

Verified rock. Retain as charted with least depth of 9ft.

## 1.14) Profile/Beam - 939/15 from hdcs\_data / nrt6\_s3003\_em3000 / 2010-230 / 616\_2000

### Primary Feature for AWOIS Item #53167

**Search Position:** 37° 53' 16.2" N, 122° 23' 20.4" W  
**Historical Depth:** [None]  
**Search Radius:** 150  
**Search Technique:** S2,MB,ES  
**Technique Notes:** [None]

#### History Notes:

L-240/92--3/18/92; (AUTHORITY- NOTICE TO MARINERS MARINE INFORMATION REPORT AND SUGGESTION SHEET) WRECK OR OTHER OBSTRUCTION OF SUBSTANTIAL MASS EXTENDS AT LEAST 2' ABOVE OTHERWISE UNIFORM BOTTOM AT THIS POSITION. DEPTHS IN VICINITY SOUNDED AT 9.9-10.1', WATER LEVEL ESTIMATED AT +1.2' ABOVE MLLW DATUM. VESSEL DRAFT WAS 8.5', IMPACTED KEEL ~6" ABOVE BOTTOM. DEPTHS OTHERWISE AS CHARTED.

### Survey Summary

**Survey Position:** 37° 53' 16.0" N, 122° 23' 17.8" W  
**Least Depth:** 1.36 m (= 4.45 ft = 0.742 fm = 0 fm 4.45 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.961$  m ; TVU (TPEv)  $\pm 0.280$  m  
**Timestamp:** 2010-230.20:08:41.062 (08/18/2010)  
**Survey Line:** hdcs\_data / nrt6\_s3003\_em3000 / 2010-230 / 616\_2000  
**Profile/Beam:** 939/15  
**Charts Affected:** 18653\_1, 18649\_1, 18652\_5, 18652\_1, 18652\_6, 18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 501\_1, 530\_1, 50\_1

#### Remarks:

Verified obstn. Wreck. AWOIS 53167.

### Hydrographer Recommendations

Obstruction was found and verified as wreck. Recommend modifying chart from original 'Obstn rep' to an obstruction circle around the wreck with a 4ft sounding over it to reflect new survey data.

#### Cartographically-Rounded Depth (Affected Charts):

4ft (18653\_1, 18649\_1, 18652\_5, 18652\_1, 18652\_6)

0  $\frac{3}{4}$ fm (18640\_1, 18680\_1, 18010\_1, 18022\_1, 18007\_1, 18020\_1, 530\_1)

1.4m (501\_1, 50\_1)



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



# Final Tidal Zoning for OPR-L430-NRT6-2010, H11641\_Rev San Francisco Bay, CA

8°

**SBF62**  
Time Corrector +24 mins.  
Range Corrector x0.98  
Reference 941-4863

**SFB60**  
Time Corrector +12 mins.  
Range Corrector x0.97  
Reference 941-4863

**SFB11**  
Time Corrector 0 mins.  
Range Corrector x0.96  
Reference 941-4863

**SFB10**  
Time Corrector -6 mins.  
Range Corrector x0.95  
Reference 941-4863

**SFB7A**  
Time Corrector +24 mins.  
Range Corrector x0.97  
Reference 941-4290

**941-4863 RICHMOND**

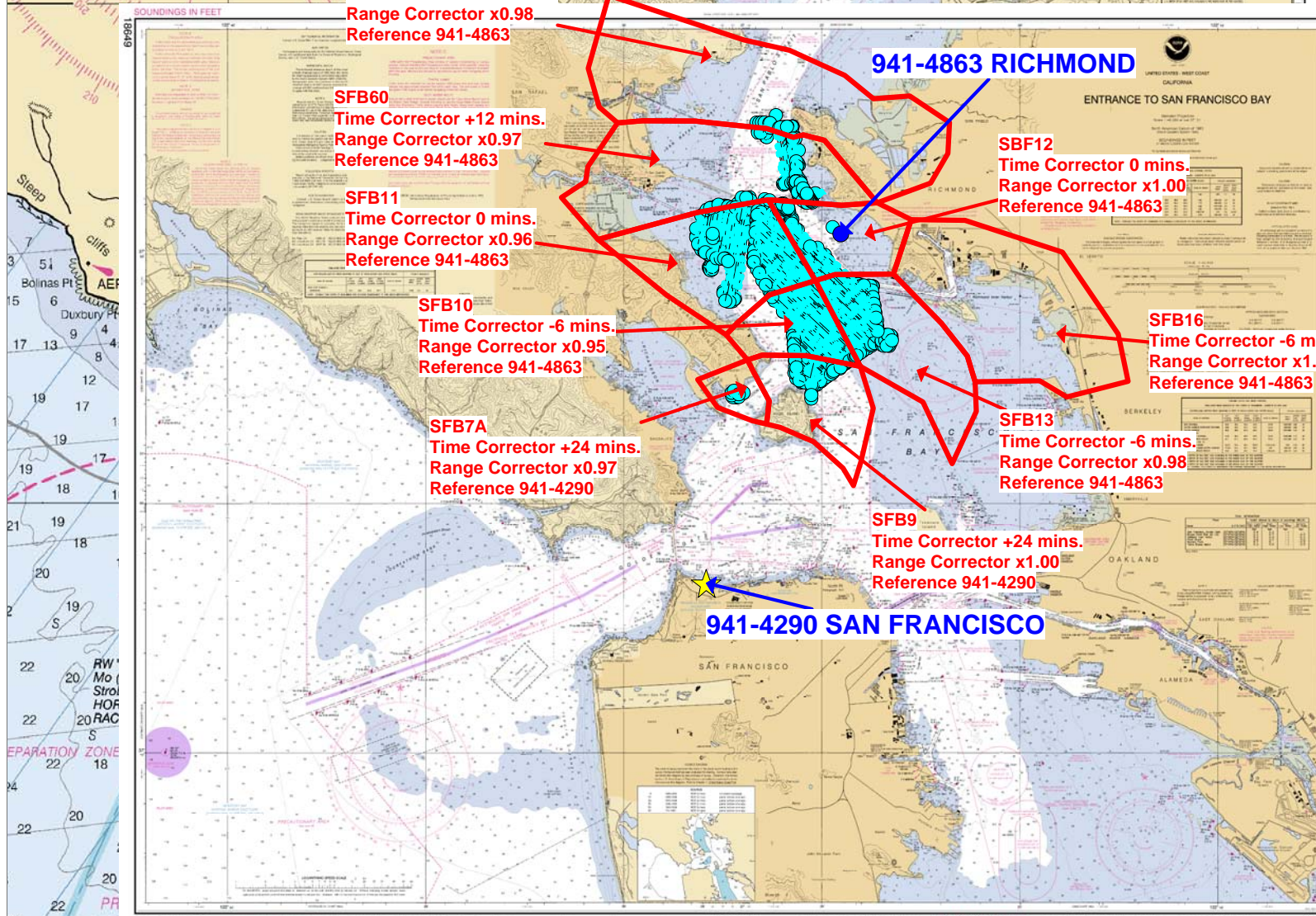
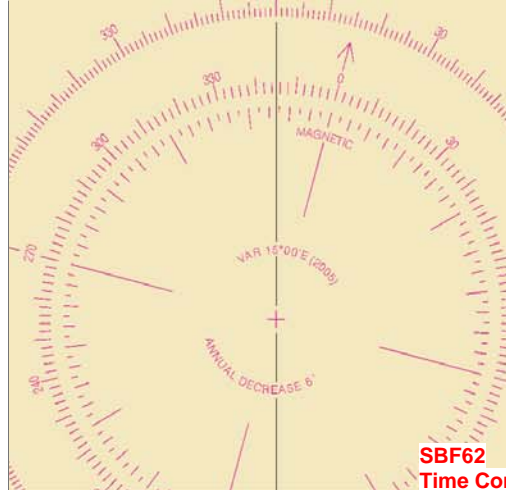
**SBF12**  
Time Corrector 0 mins.  
Range Corrector x1.00  
Reference 941-4863

**SFB16**  
Time Corrector -6 mins.  
Range Corrector x1.01  
Reference 941-4863

**SFB13**  
Time Corrector -6 mins.  
Range Corrector x0.98  
Reference 941-4863

**SFB9**  
Time Corrector +24 mins.  
Range Corrector x1.00  
Reference 941-4290

**941-4290 SAN FRANCISCO**





# PHB Compilation Log

## General Survey Info

Survey Number	H11641	Field Unit	NRT6	State	CA	UTM Zone	10N
Project Number	OPR-L430-NRT6-10	Project Name (Locality)	San Francisco Bay				
Start Date	05/25/2010	Sublocality	Raccoon Strait to Point San Pablo				
End Date	01/12/2011	Survey Scale	1:10,000	Compilation Scale	1:20,000		

### Affected Raster Charts

Chart	KAPP	Scale	Edition	Date	NTM Date
18653	1939	1:20,000	11th	10/01/2009	03/20/2010



### Affected Electronic Charts

ENC	Scale
US5CA21M	1:20,000



### Spatial Reference

Horizontal Datum	WGS84
Coordinate System	LLDG
Sounding Datum	MLLW
Vertical Datum	MHW

### Junction Surveys

Survey Number	Survey Date	Location Relative to Current Survey
N/A		(NE, SW, NNW, ect.)

# PHB Compilation Log

## Processing Info

HCell Compiler  QC Reviewer  SAR Reviewer

Source Surfaces	
Resolution	File Name
0.5	H11641_50cm_SAR_Final
<input type="button" value="Add Surface"/>	<input type="button" value="Remove Surface"/>

Supporting Documents	
Name	Version
Specs and Deliverables	April 2011
HCell Specs	6.1
<input type="button" value="Add Doc"/>	<input type="button" value="Remove Doc"/>

Software Used		
Software	Version, HF	Used For
CARIS HIPS	7.0 SP2 HF3	SAR Review. Inspection of Combined BASE Surfaces.
Pydro	11.8	SAR Review. Generation of Features Reports.
CARIS BASE Editor	3.2 HF5	Creation of soundings and bathy-derived features, meta area object, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer	2.2 HF4	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS	4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding. (For Fathoms and Feet chart units only.)
CARIS HOM	3.3 SP3 HF8	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding. (For Fathom and Feet chart units only)
CARIS Plot Composer	5.1	Generate plots of CARIS Session files used for QC.
HydroService, dKart Inspector	5.1	Validation check of the base cell file.
Fugawi View ENC	1.0.0.3	Independent inspection of final HCells using COTS viewer.

## Product Info

Deliverables	
Chart Scale HCell	<input type="text" value="H11641_CS.000"/>
Survey Scale HCell	<input type="text" value="H11641_SS.000"/>
HCell Report for MCD	<input type="text" value="H11641_HR.pdf"/>
Feature Listing	<input type="text" value="H11641_FL.txt"/>
Descriptive Report	<input type="text" value="H11641_DR.pdf"/>
Survey Outline	<input type="text" value="H11641_Outline.gml and .xsd"/>

Horizontal and Vertical Units	
During creation of the HCell all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less.	
Depth Units (DUNI)	<input type="text" value="Feet"/>
Height Units (HUNI)	<input type="text" value="Feet"/>
Positional Units (PUNI)	<input type="text" value="Meters"/>

# PHB Compilation Log

## Radius Setting

A survey-scale sounding (SOUNDG) feature object layer was built from the Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at survey scale using a Radius Table file with values shown below.

Radius (mm)	Min. Depth (m)	Max Depth (m)
3	-4.7	10
4	10	20
4.5	20	50
5	50	500

## Contours

Depth contours at the intervals on the largest scale chart are included in the SS HCell for MCD raster charting division to use for guidance in creating chart contours. With the exception of the zero contours included in the \*\_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography.

Charted Contours	Metric Equivalent	Metric- NOAA Rounded	Chart Contours - NOAA Rounded
6ft	1.8288m	2.0574m	6.75ft
12	3.6576	3.8862	12.75
18	5.4864	5.715	18.75
30	9.144	9.3726	30.75
60	18.288	18.5166	60.75
90	27.432	27.6606	90.75
120	36.576	36.8046	12.75

Add Contour

Remove Contour

## Additional Info

### Contact Information

Inquiries regarding this HCell content or construction should be directed to:

HCell Compiler

Annie Raymond

Phone Number

206-526-6849

Email

annemieke.raymond@noaa.gov

### Compilation Comments

APPROVAL SHEET  
H11641

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproof of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the HCell, accompanying data, and reports. This survey and accompanying digital data meet or exceed OCS requirements and standards for products in support of nautical charting except where noted in the Descriptive Report.