H11927

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. RA-10-21-08

Registry No. H11927

LOCALITY

State Oregon

General Locality Approaches to Warrenton

Sublocality Tongue Pt. to Harrington Pt.

2008

CHIEF OF PARTY
Captain Donald W. Haines, NOAA

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DATE

NOAA FORM 77-28 (11-72)

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

REGISTRY No

H11927

HYDROGRAPHIC TITLE SHEET

INSTRUCTIONS – 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

RA-10-21-08

State: **Oregon**

General Locality: **Approaches to Warrenton**

Sub-Locality: **Tongue Pt. to Harrington Pt.**

Scale: **1:10,000** Dates of Survey: **9/15/2008 - 9/23/2008**

Instructions dated: **8//8/2008** Project No.: **OPR-N338-RA-08**

Vessel: **RA3 (1021), RA1 (1101), RA2 (1103), RA4 (2801), RA5 (2802), RA9 (915 Ceeducer)**

Chief of party: **Captain Donald W. Haines, NOAA**

Surveyed by: **RAINIER Personnel**

Soundings by echo sounder, hand lead, pole: **Reson 8101, Tilted Reson 8125, Knudsen 320M, Reson 7125, Ceeducer**

Graphic record scaled by: **N/A**

Graphic record checked by: **N/A** Automated Plot: **N/A**

Verification by: **Martha Hertzog, Peter Holmberg**

Soundings in: **Feet at MLLW**

REMARKS: **All times are UTC. UTM Projection (zone #10).**

Revisions and annotations appearing as endnotes were generated during office processing. As a result, page numbering may be interrupted or non-sequential.

All separates are filed with the hydrographic data.

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537

Descriptive Report to Accompany Hydrographic Survey H11927

Project OPR-N338-RA-08
Approaches to Warrenton, Oregon
Tongue Pt. to Harrington Pt.
Scale 1:10,000
September 15-23, 2008
NOAA Ship *Rainier* (s221)
Chief of Party: Captain Donald W. Haines, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-N338-RA-08 dated August 08, 2008 and all other applicable direction[I], with the exception of deviations noted in this report. The survey area is Tongue Pt. to Harrington Pt. This survey corresponds to sheet "F" in the sheet layout provided with the Letter Instructions.

OPR-N338-RA-08 responds to changes in the Lower Columbia River which is subject to extreme conditions, from winter storms that pound the west entrance to high spring run-off which flood and cause silting in the eastern portion. Deep draft vessels routinely transit the lower Columbia River enroute to various ports upriver, such as Portland, Vancouver, and Longview. In addition, two separate sites along the Lower Columbia are pursuing an LNG terminal, which may have the potential for up to 10 LNG vessel port calls each month. Although the US Army Corps of Engineers (USACE) maintains the navigational channels on the Columbia River, many changes have occurred outside the navigational channels since the last surveys were conducted in the 1950's. Charted sounding data outside the USACE maintained channels is unreliable, as proven by an NRT reconnaissance survey in 2004.

Complete multibeam echo sounder (MBES) coverage and/or 200% SSS with concurrent MBES coverage was obtained in the survey area in waters 4 meters and deeper except for areas mentioned in this Descriptive Report. In depths less than 4 meters additional MBES coverage was obtained to acquire least depths over significant features or shoals, as appropriate for this survey.[1] Vertical beam echo sounder (VBES) data were acquired in depths from approximately 2 to 15 meters to define the navigable area limit, aid in the planning of MBES data acquisition, and provide inshore bathymetry in navigationally significant areas.[2] 200% side scan sonar (SSS) coverage was primarily acquired in the main channel of the Columbia River to improve probability of detection of submerged hazards in navigationally critical areas and in areas where complete MBES coverage was not obtained. The total mileage for each vessel and system used in this survey is referenced below in Table 1.

[I] NOS Hydrographic Surveys Specifications and Deliverables (April 2008), OCS Field Procedures Manual for Hydrographic Surveying (May 2008), and all Hydrographic Surveys Technical Directives issued through the dates of data acquisition.

Due to limited time constraints, survey coverage was "blocked off" to maximize coverage of the navigationally significant area of the Columbia River. Limited survey coverage was obtained north of Rice Island, focused on detecting a "buoy run" north from Harrington Pt. to Rocky Pt. (See Figure 1)[3]

Limited Shoreline Verification was performed for survey H11927.

Data Acquisition Type	Hull Number with Mileage (nm)						Total
	1101	1103	1021	2801	2802	915	
VBES (mainscheme)	33.94	90.57	-	-	-	12.71	137.22
MBES (mainscheme)	-	-	23.52	48.95	-	-	72.47
SSS (mainscheme)	-	-	-	-	2.09	-	2.09
MBES + SSS (mainscheme)	-	-	-	-	133.01	-	133.01
Cross lines	24.73	2.63	1.84	2.22	-	-	31.42
Developments	-	1.70	-	-	5.01	-	6.71
Shoreline	-	33.05	-	-	-	-	33.05
Total Number of Items Investigated	2	41	-	-	1	-	44
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	12.71

Table 1: Statistics for survey H11927

Data acquisition was conducted from September 15 to September 23, 2008 (DN 259 to 267).

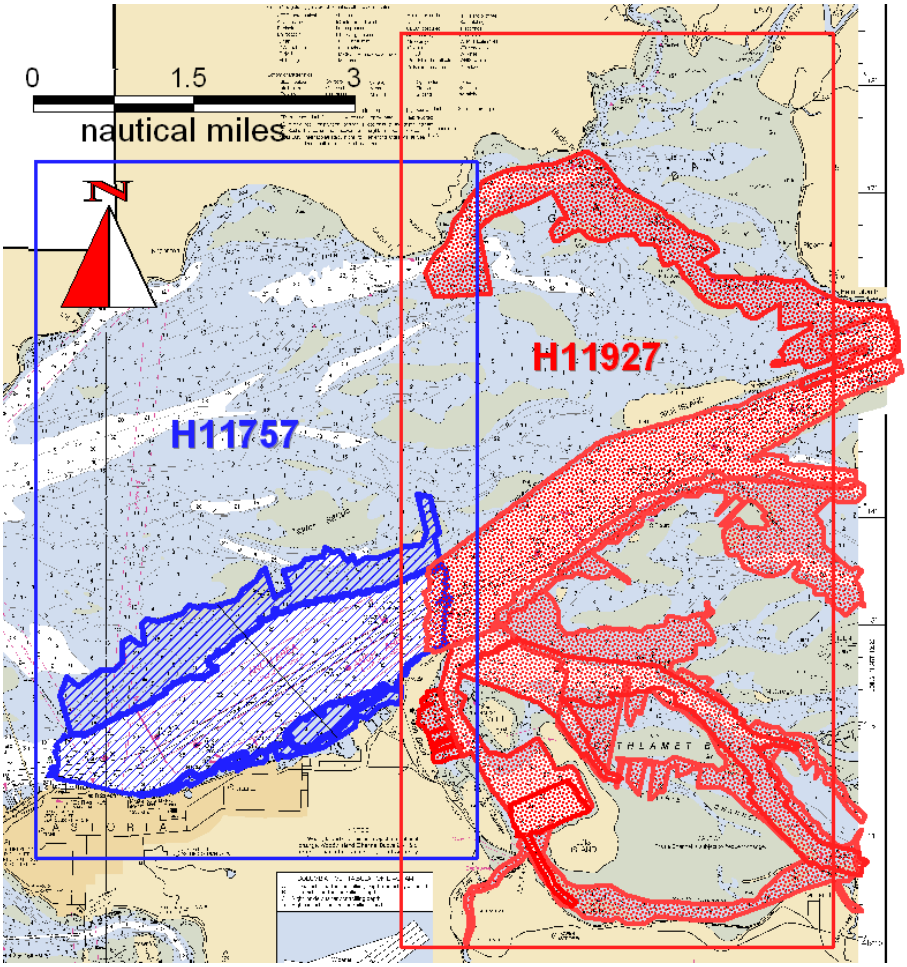


Figure 1: H11927 Survey Limits and junction overlaid on (18521)

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods can be found in the *OPR-N338-RA-08 Data Acquisition and Processing Report* (DAPR)[4], submitted under separate cover. Items specific to this survey, and any deviations from the DAPR are discussed in the following sections.

Final Approved Water Levels have been applied to this survey. See Section C. for additional information.

B1. Equipment and Vessels

Data for this survey were acquired by the following vessels:

Hull Number	Name	Acquisition Type
1101	RA-1	Vertical Beam Echosounder Detached Positions
1103	RA-2	Vertical Beam Echosounder Detached Positions
1021	RA-3	Multibeam Echosounder
2801	RA-4	Multibeam Echosounder
2802	RA-5	Multibeam Echosounder Side Scan Sonar Detached Positions
915	RA-9	Vertical Beam Echosounder

Table 2: Data Acquisition Vessels for H11927

Sound speed profiles were measured with SEACAT 19+ profilers in accordance with the Specifications and Deliverables.

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

MBES and VBES cross lines totaled 31.42 nautical miles, comprising 9.17% of main scheme hydrography. The majority of the cross lines were run with VBES. The main scheme bathymetry was manually compared to the XL nadir beam in CARIS Subset Mode and agreed well with differences no greater than 0.3 meters.[5]

A statistical Quality Control Report has been conducted on representative data acquired with each system used on this survey. Results of these tests are included in the updated 2008 *Rainier* Hydrographic System Readiness Review package[6] submitted with this survey.

Junctions

The following contemporary survey junctions with H11927 (See Figure 1):

Registry #	Scale	Date	Junction side
H11757	1:10,000	2007	West

A comparison between H11927 and its contemporary bathymetric survey, H11757, revealed excellent agreement observed within the main channel with gross discrepancies north and south of Tongue Pt. Channel (See Figure 1). North of the channel, survey discrepancies were up to 0.3 m while south of the channel the discrepancies were up to 2 m. The comparison was conducted in CARIS subset mode. The gross discrepancies outside the channel are primarily due to the time lapse between survey H11757 and survey H11927.[7] Shifting sand waves predominate in these areas and the river floor is dynamic in time. The USACE is responsible for dredging the main channel allowing for depths to remain at a more uniform level within the channel with respect to adjacent areas, explaining why there is excellent agreement within the main channel.

Data Quality Factors

Limited Coverage

Survey H11927 focused on navigationally significant areas, such as the main channels. Due to limited time constraints and the very shallow nature of this survey, complete MBES coverage does not extend to the 4 meter curve in some areas as illustrated below.[8]

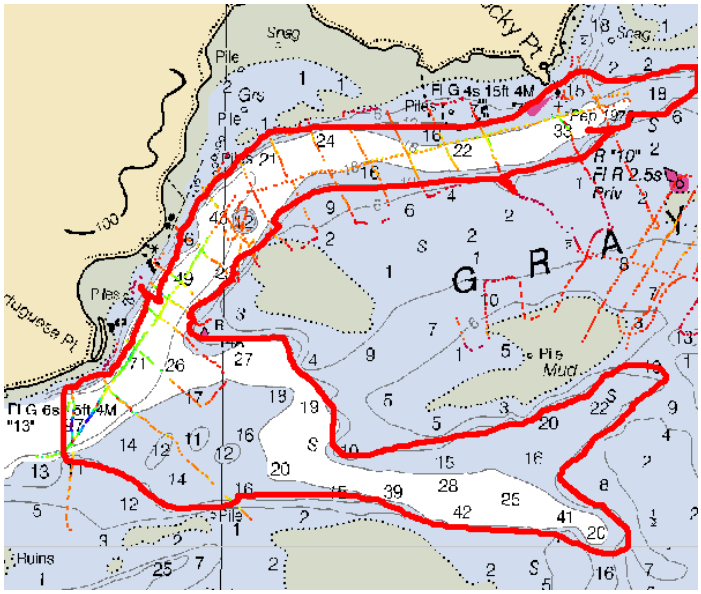


Figure 2: Complete MBES or 200% SSS coverage does not extend to the 4m curve (vicinity of Rocky Pt., 18521)

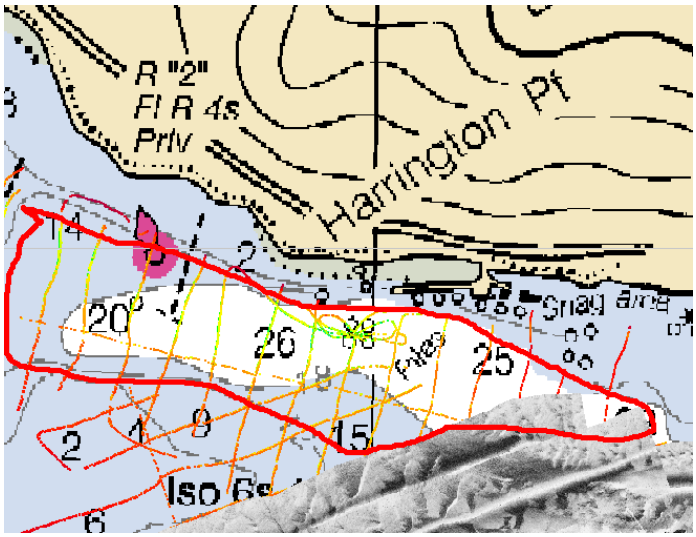


Figure 3: Complete MBES or 200% SSS coverage does not extend to the 4m curve (vicinity of Harrington Pt., 18521 & 18523)

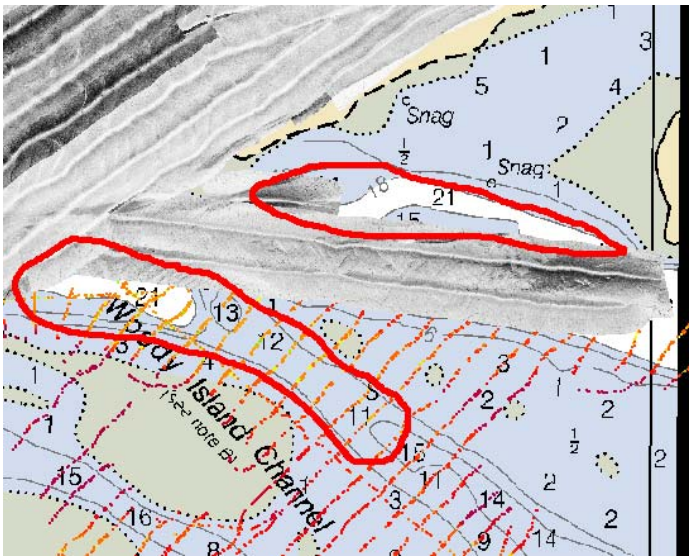


Figure 4: Complete MBES or 200% SSS coverage does not extend to the 4m curve (vicinity of Miller Sands, 18521)

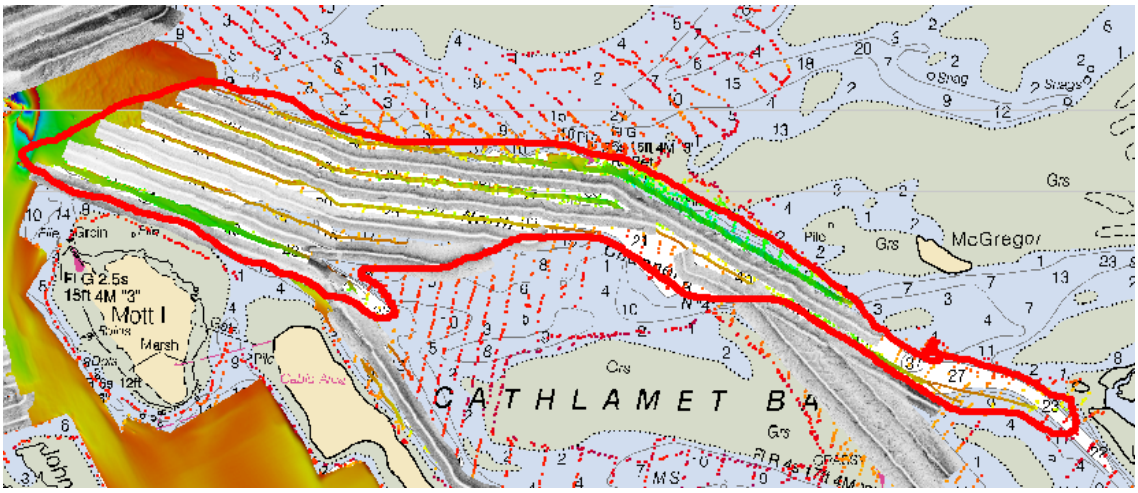


Figure 5: Complete MBES or 200% SSS coverage does not extend to the 4m curve (Cathlamet Bay-North Channel, 18521)

B3. Data Reduction

Data reduction procedures for survey H11927 conform to those detailed in the *OPR-N338-RA-08 DAPR.*

B4. Data Representation

Many BASE surfaces were used in processing H11927. Final BASE surface resolutions and depth ranges were set in accordance with Specification and Deliverables Complete Multibeam Coverage requirements.[9] Field sheets have a grid resolution of at least 10% of the depth and are smaller than $25x10^6$ nodes. Depth ranges used in survey H11927 are shown in Table 3 below. The submission Field Sheet and BASE surface structure and layout is shown in Figures 6, 7 & 8.

Depth Ranges for Finalized Surface	Resolution
0 – 21.5 m	1 m
18.5 - 52 m	2 m

Table 3: Depth ranges and resolution of BASE surfaces used in survey H11927

SSS data were acquired for object detection in areas in and around the USACE channel. SSS data was split into two complete coverage mosaics to demonstrate areas covered by this technique (in addition to the required complete MBES). These mosaics were named "2802_K5K_100" and "2802_K5K_200".

Soundings were generated in CARIS HIPS from the final combined BASE surface for field unit review purposes. They are included for reference only and are not intended as a deliverable.

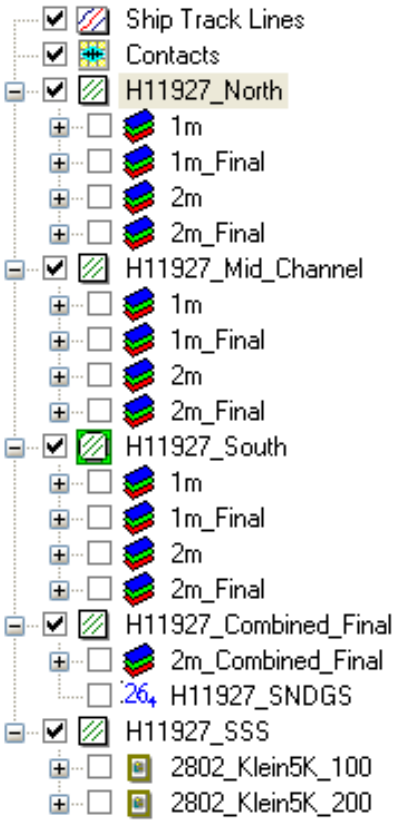


Figure 6: Field sheets and BASE surfaces submitted with H11927

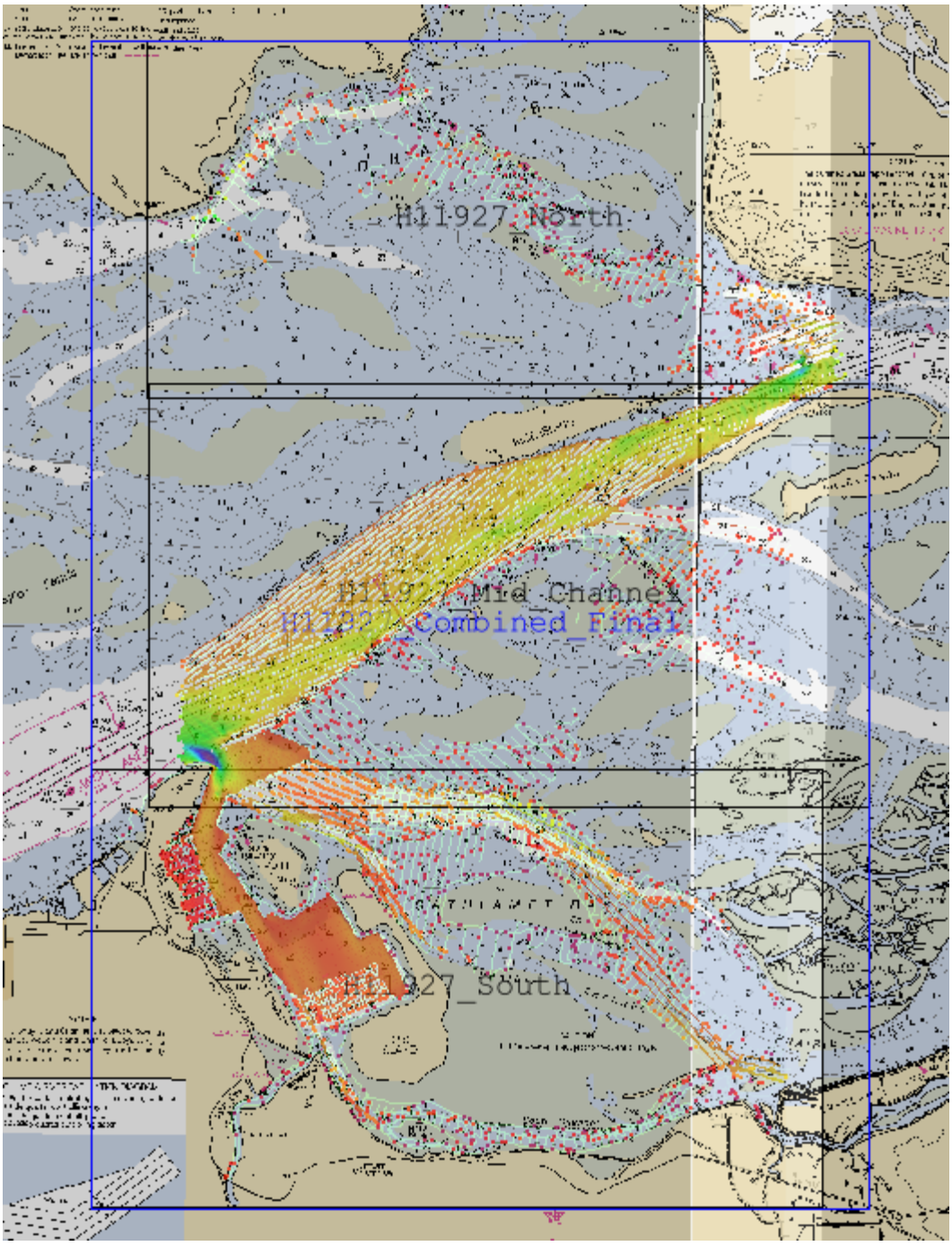


Figure 7: Layout of field sheet and BASE surfaces for H11927 overlaid on NOAA Charts 18521 and 18523

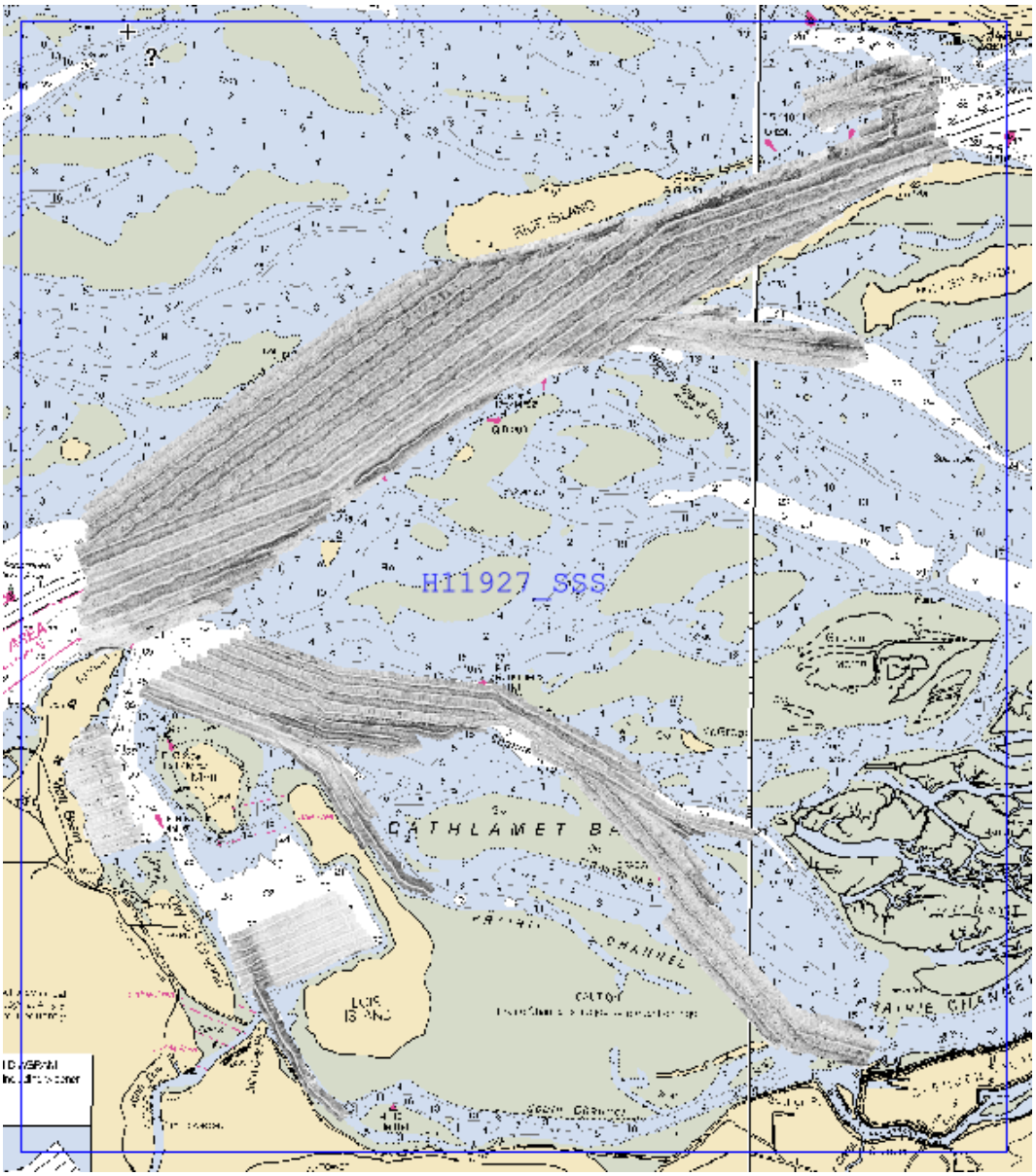


Figure 8: Layout of Side Scan Sonar for H11927 overlaid on NOAA Chart 18521 and 18523

C. VERTICAL AND HORIZONTAL CONTROL

Project OPR-N338-RA-08 did not require static GPS observations or other horizontal control work, and all tide corrections were generated from CO-OPS maintained tide stations. Thus, no Horizontal and Vertical Control Report will be submitted.

Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. The differential corrector beacons utilized for this survey are given in Table 4.

Location	Frequency	Operator	Distance	Priority
Fort Stevens, OR	287 kHz	USCG	14.5nm	Primary

Table 4: Differential Corrector Sources for H11927

Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Astoria, OR (943-9040) served as control for datum determination and as the primary source for water level reducers for survey H11927.

No tertiary gauges were required.

All data were reduced to MLLW using **final approved water levels** from station Astoria, OR (943-9040) using the tide file 9439040.tid and final time and height correctors using the zone corrector file N338RA2008CORP.zdf.

The request for Final Approved Water Levels for H11927 was submitted to CO-OPS on September 26, 2008 and the Final Tide Note was received on October 10, 2008. This documentation is included in Appendix IV.[10]

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11927 was compared with the following charts:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
18521	1:40,000	73rd Ed, Apr 2008	03/25/2008
18523	1:40,000	56th Ed; Oct 2006	09/26/2006

Table 5: Charts compared with H11927

The survey area for H11927 is situated in a river basin characterized by swift currents and considerable sediment transport. The charted depths outside the main navigation channel are based on surveys over 50 years old. Due to dynamic nature of the seafloor in this area, significant deviations were noted between survey H11927 and chart 18521 and 18523.[11]

In the area around North Channel in Grays Bay, survey sounding deviate significantly from charted depths. For example, survey H11927 shows soundings deeper than 20 ft on a charted drying mud flat in Grays Bay (See Figure 9). Although *Rainier's* boat crews did their best to safely navigate to, and define, the 2m curve, the huge discrepancy of the river floor prevented coverage to the inshore limit in the time allotted for the project. The Hydrographer recommends that the area be flown with tide coordinated aerial photogrammetry to update the low water areas and that survey soundings supersede all prior survey and charted depths in the common area.[12]

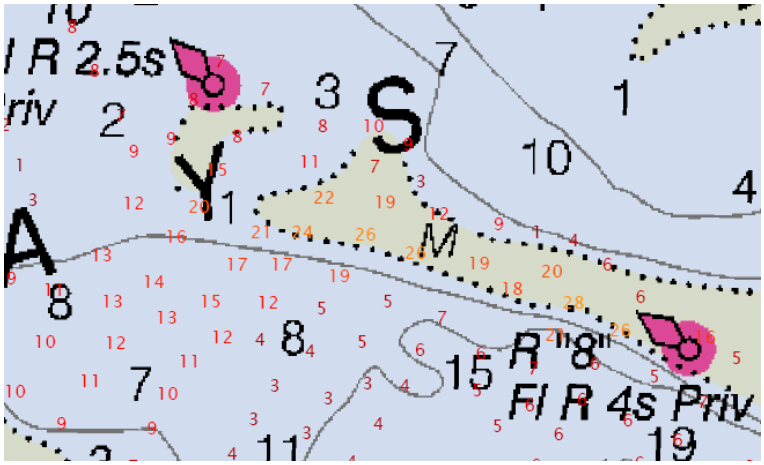


Figure 9: Survey soundings overlaid on charted mud flat in Grays Bay-North Channel (18521)

Cathlamet Bay is another area of extreme discrepancies between this survey and the chart. Survey soundings overlaid on charted mud flats were not uncommon in the vicinity of Cathlamet Bay-North Channel (See Figure 10). Changes in the bathymetry and the lack of knowledge within the common area again made delineating the 2 meter curve a challenge which resulted in areas that were not surveyed. The Hydrographer recommends that the area be flown with tide coordinated aerial photogrammetry to update the low water areas and that survey soundings supersede all prior survey and charted depths in the common area.[13]

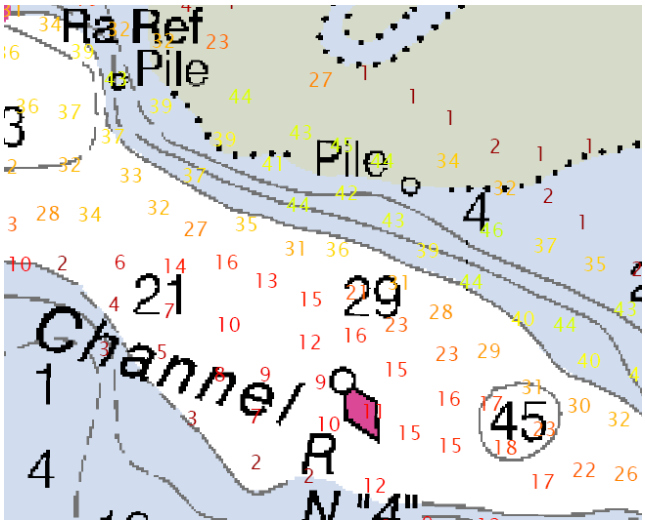


Figure 10: Survey soundings overlaid on charted mud flat in Cathlamet Bay-South Channel (18521)

The current survey shows significant shoaling in the area east of John Day Channel. Survey soundings are up to 13 feet shoaler than charted depths. Two submitted DTONs, circled in red, are also illustrated in Figure 11. The 5ft. survey sounding (northernmost circle) is the shoalest of 5 contacts obtained with 8101 mainscheme. The 15ft. survey sounding (southermost circle) is within the vicinity of a charted 20ft. depth. Further information regarding these DTONs can be found in the DTON Report[14] and/or Notebook. The Hydrographer recommends charting as per digital data.[15]

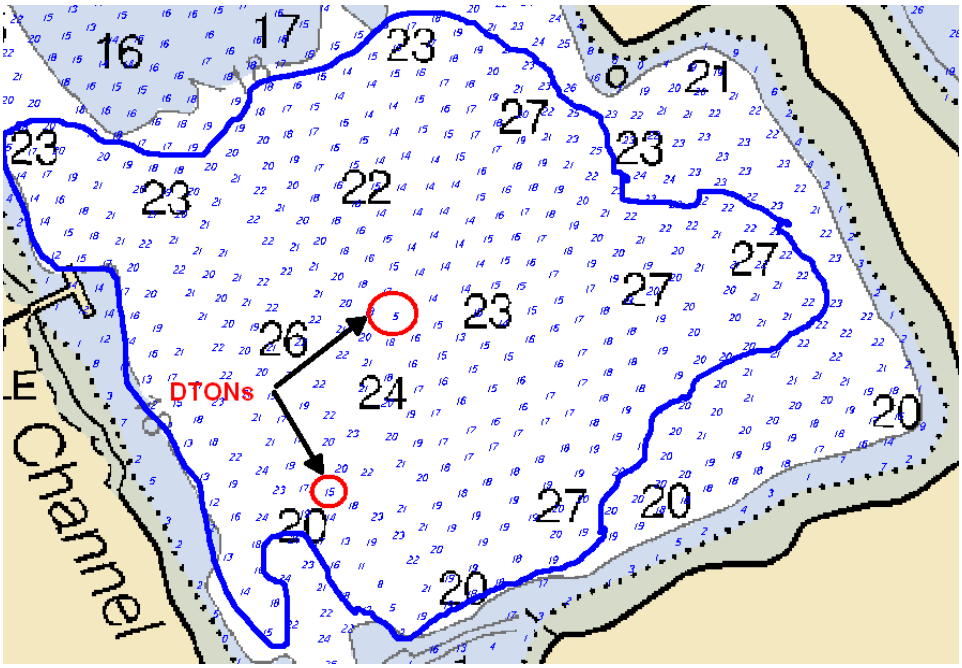


Figure 11: General area of shoaler than charted (18521)

The charted 5 foot sounding and associated depth contour located north of Miller Sands Range, approximately 530 meters north of the Red "6" buoy, was not detected with VBES, MBES, or SSS coverage. (See Figure 12) The least depth for the common area was discovered to be 16 feet at the southern edge of the charted wing wall. The Hydrographer recommends removing the charted 5 ft sounding and charting as per digital data.[16]

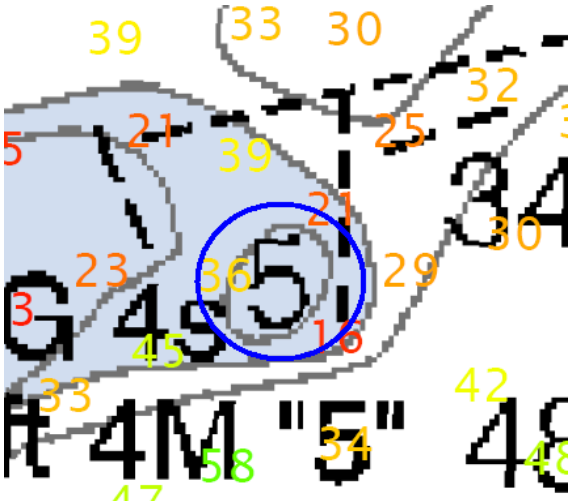


Figure 12: 5ft. sounding not detected (18521, 18523)

The three charted wing walls, circled in red, south of Harrington Pt. were not detected with VBES, MBES, and SSS searches (See Figure 13). These wing walls were correctly not contained in the original composite source file. The other charted wing walls in the common area are in good condition and are correctly charted. The Hydrographer recommends charting the wing walls as per field verified HOB file. [17]

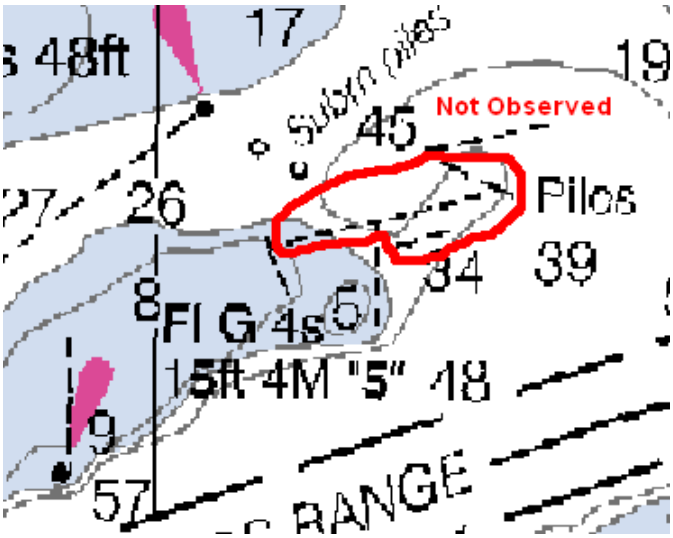


Figure 13: Charted wing walls not observed (18521, 18523)

The three charted wing walls west of Harrington Pt. were observed to be correctly charted and in ruined condition except as modified in the Field Verified HOB file (See Figure 14). The Hydrographer recommends retaining these wing walls as charted and modified in the digital data.[18]

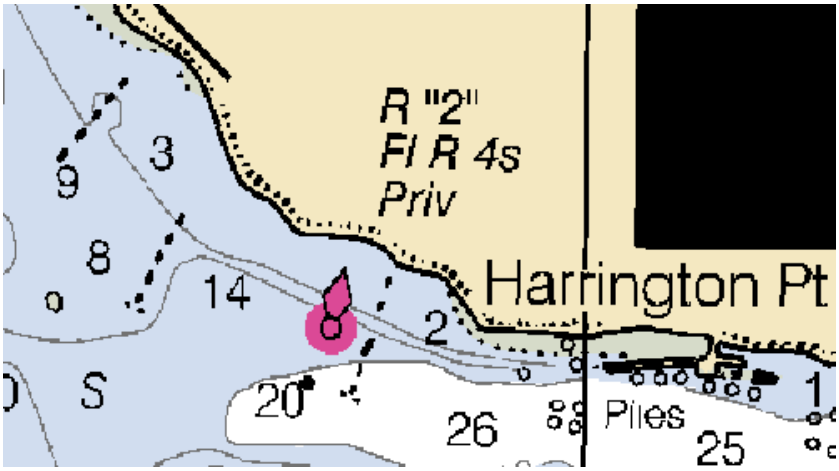


Figure 14: Charted wing walls observed (18521)

The four charted piles circled in blue, south of Harrington Pt., were not detected (See Figure 15). These piles were investigated visually and using a VBES star pattern (1103-DN267). Full 200% SSS coverage was not obtained in the common area. The Hydrographer recommends retaining the charted piles as "Subm piles".[19] (18521, 18523)

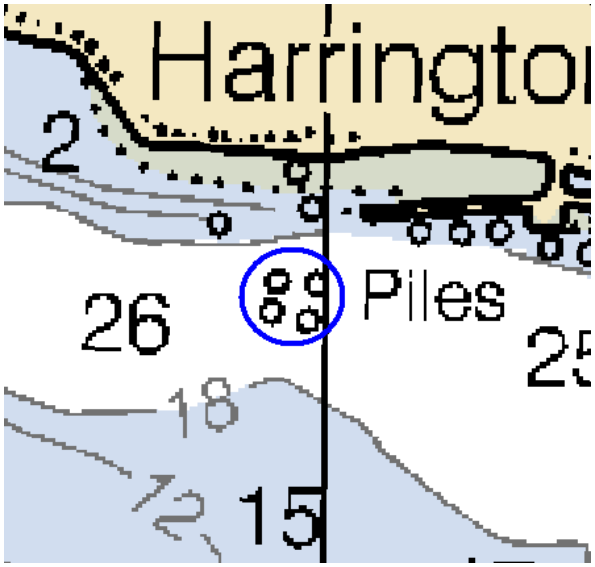


Figure 15: Charted piles not detected (18521, 18523)

The two charted submerged piles circled in blue, south of Harrington Pt., were not detected (See Figure 16). These piles were investigated visually and using a VBES star pattern (1103-DN267). Full 200% SSS coverage was obtained in the common area further disproving these piles. The Hydrographer recommends removing the charted submerged piles and charting common area as per digital data.[20] (18521, 18523)

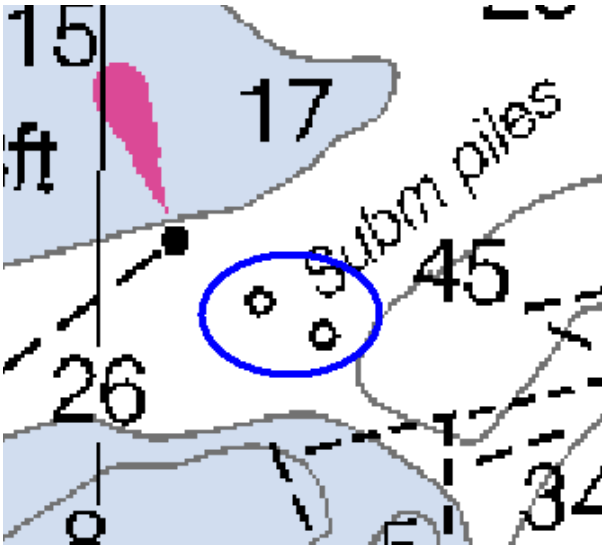


Figure 16: Charted submerged piles not detected (18521, 18523)

The three charted piles, circled in blue, in the vicinity of the Green "3" Light in Cathlamet Bay North Channel were not detected during shoreline. (See Figure 17) These piles were investigated visually and using a VBES star pattern (1103-DN264). Full 200% SSS coverage was not obtained in the common area. The Hydrographer recommends retaining these piles as "Subm piles".[21] (18521)

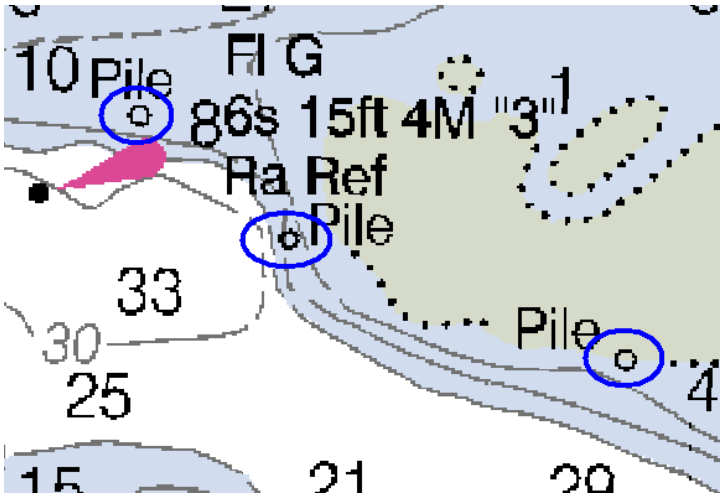


Figure 17: Charted piles not detected (18521)

The main channel is sounded to, or deeper than, depths tabulated by the Army Corps of Engineers.

The Hydrographer recommends adding a "CAUTION: Cathlamet Bay subject to frequent change" notation and retaining "CAUTION: Prairie Channel subject to frequent change" notation on chart 18521.[22]

The Hydrographer recommends that the area be flown with aerial photogrammetry to chart the MLLW line and that survey soundings supersede all prior survey and charted depths in the common area.[23]

D.1.b. Dangers to Navigation

Twenty-one (21) Dangers to Navigation (DTONs) and three anti-DTONs were found on survey H11927, and reported to the Marine Chart Division via email on March 20, 2009. Two DTON reports were submitted on the same day. One report includes the 21 Dangers to Navigation and the other report lists three depths that should be removed from the chart. The original DTON submission package is included in Appendix I. Descriptions of each DTON are included in the Survey Feature Report in Appendix II.[24]

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

Two (2) AWOIS items fall within the survey limits of H11927. AWOIS item 53698 located at approximate position 46º15´N, 123º41´W was not detected. (See Figure 18) This item was assigned for full investigation of a charted pile on the edge of the channel of Miller Sands Range. 200% Side scan sonar was achieved in the entirety of the search radius and no indication of the piling was found. The Hydrographer recommends removing the charted pile from the chart.[25]

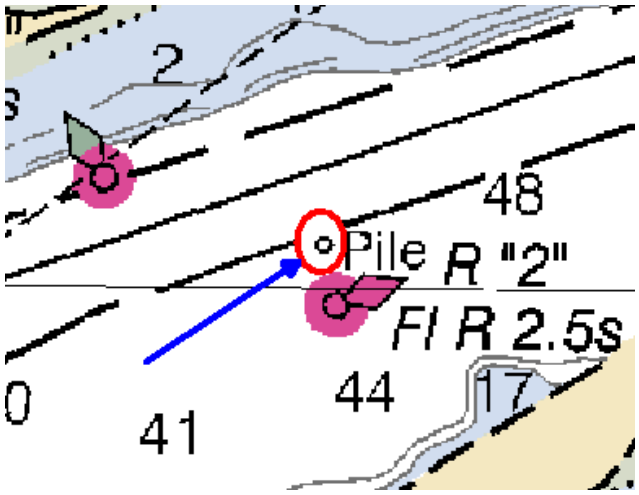


Figure 18: AWOIS item 53698 (18521)

AWOIS item 53699 located at approximate position 46º17´N, 123º45´W was detected (See Figure 19) with VBES. This item was assigned for full investigation of a charted 12 foot sounding and associated depth contour. A shoal area was detected with VBES coverage and further investigated with a star pattern (RA2-1103, DN 267). This 12 foot sounding and depth contour was surveyed to a least depth of 11.6 feet. The Hydrographer recommends charting as per digital data.[26]

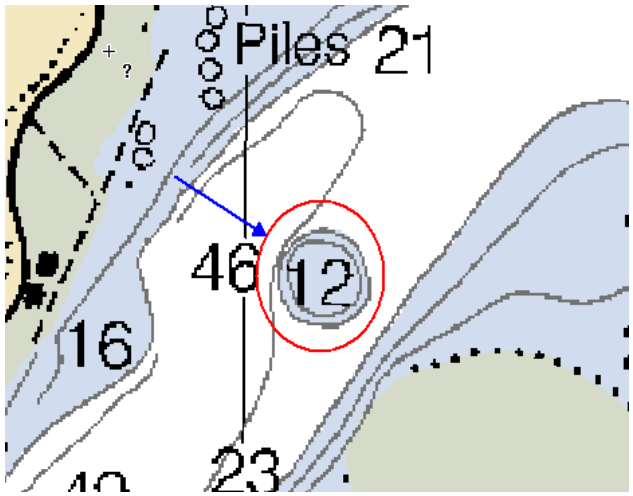


Figure 19: AWOIS item 53699 (18521)

Descriptions of each AWOIS item investigation are included in the Survey Feature Report in Appendix II.[27]

Additional Items

Two charted active boat ramps in Mott Basin were observed to extend far below the waterline and into the survey area. Figure 20 illustrates the submerged portion of the northernmost Mott Basin boat ramp in the SSS and the limited MBES data collected due to the shallow nature of this feature. The extents of the submerged portion of the boat ramp were digitized into the field verified HOB file and classified as SLCONS based on the SSS data. The Hydrographer recommends charting as per digital data depicting the submerged portion of the boat ramp (18521).[28]

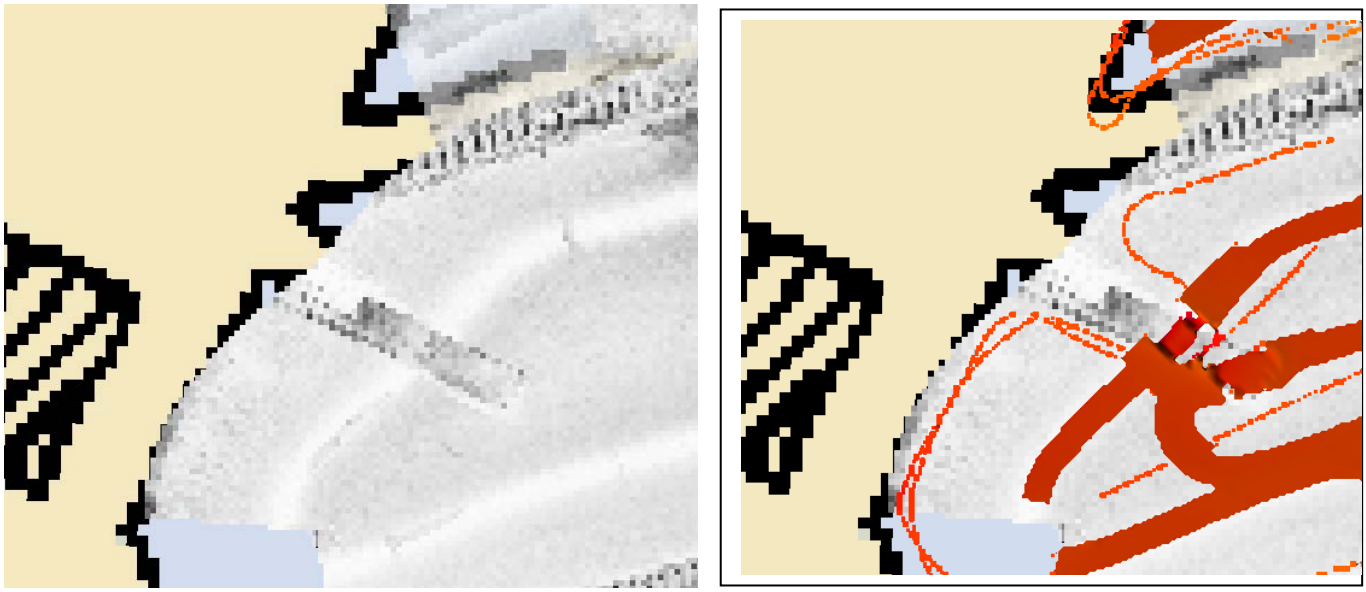


Figure 20: Northernmost boat ramp in Mott Basin (18521); left- SSS mosaic; right- SSS mosaic and MBES data

A charted obstruction attached to the end of the southernmost boat ramp in Mott Basin was observed to be the extension of the ramp below the waterline as is illustrated with the SSS mosaic (See Figure 21). The Hydrographer recommends removing the charted obstruction and charting as per digital notebook data depicting the submerged portion of the boat ramp (18521).[29]

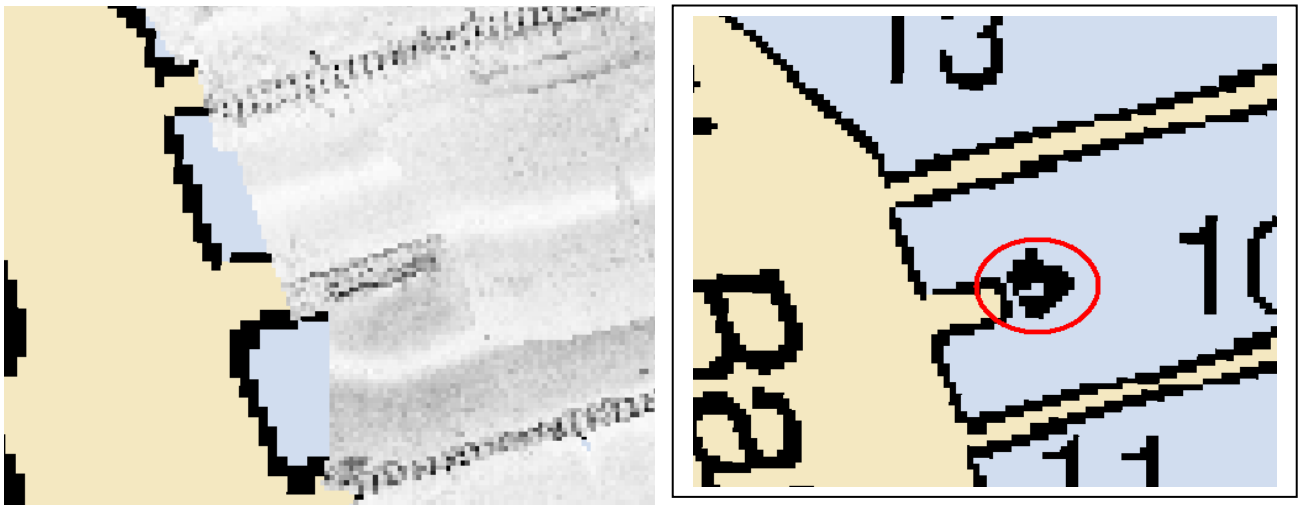


Figure 21: Southernmost boat ramp in Mott Basin (18521); left- SSS mosaic; right- associated charted obstruction

Additional features investigated within the limits of H11927 are further described in the Survey Feature Report in Appendix II.[30]

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed.

D.2.b. Shoreline Verification

Shoreline Source

The source shoreline for project OPR-N338-RA-08 is a composite source file compiled from the latest ENCs OR0201, and survey features from prior hydrographic surveys. Features shown on the current edition of chart 18521 but not included in the composite source file provided with the project instructions were manually digitized in CARIS Notebook by *Rainier* personnel, and added to a composite shoreline source file. Finally, a copy of this *Rainier* modified project wide composite source file was trimmed down to include only the shoreline and features that applied to each individual survey.

Shoreline Verification

Limited shoreline verification was conducted near predicted low water in accordance with the Specifications and Deliverables and FPM sections 6.1 and 6.2. Detached positions (DPs) acquired during shoreline verification were recorded in HYPACK, on DP forms, and processed in PYDRO. These indicate revisions to features and features not found on the verified shoreline. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline. DP forms are included in the *Separates to be Included with Survey Data.*[31]

All shoreline data is submitted in CARIS Notebook .hob files. Table 6 lists and describes the files contained in H11927_Notebook.wrk:

HOB File	**Purpose and Contents**
H11927_Comp_Source.hob	Original Source Data as filtered to the limits of survey H11927.
H11927_Field Verified.hob	Field verified source features and shoreline, including all edits, updates and DPs.
H11927_Disprovals.hob	Features disproved by this survey. (PYDRO keyword "SURVEY" and carto action "delete".)

Table 6: List and Description of Notebook HOB files

Source Shoreline Changes and New Features

Items for survey H11927 that require further discussion and are associated with a detached position, have been flagged "Report" in PYDRO in H11927_PSS.pss. Investigation methods and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix II.

Recommendations

The Hydrographer noted great discrepancies between charted shoreline data and what was observed in the field. Great deals of these data were shoreward of the Navigational Area Limit Line (NALL) and not addressed as part of this survey. One area of particular note is the John Day River. The development of shoreline construction (floating houses) has greatly altered the existing shoreline in this area. Detached Positions were not taken for every SLCONS. The Hydrographer recommends flying aerial photogrammetry in the area in order to correctly depict these features.[32]

The Hydrographer recommends that the shoreline as depicted in the Notebook .HOB files supersede and complement shoreline information compiled on the CFF and charts as described above.[33]

D.2.c. Aids to Navigation

Twenty-four (24) CG Aids and Six (6) Private Buoys were found within the limits of H11927. All aids to navigation (ATONs) were found to be correctly charted and serve their intended purpose.[34]

D.2.d. Overhead Features

There are three overhead features within the limits of survey H11927. A charted railroad bridge located at John Day Pt., had an observed overhead clearance of approximately 2.5 meters when closed. (See Figure 22) The charted railroad bridge position appears to be correctly charted and in very good condition. When the bridge is open, as illustrated in Figure 22, one could navigate on either side of the bridge. The Hydrographer recommends correcting the charted symbol in order to accurately depict a rotating bridge feature.[35] (18521)

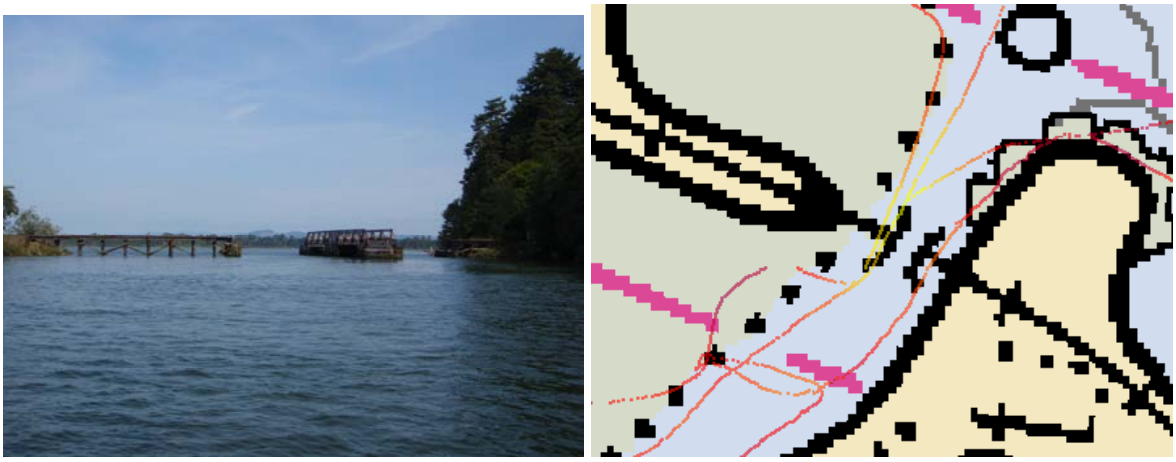


Figure 22: Rotating Railroad Bridge; Camera angle view is from South to North (18521)

The bridge further south in the John Day River is well charted and has an overhead clearance of 10 meters using a laser range finder. (See Figure 23) The Hydrographer recommends retaining this bridge feature as charted.[36]

Figure 23: Charted Bridge (18521)

A set of overhead power cables as charted in the middle of John Day River were observed and well charted. (See Figure 24) The Hydrographer recommends retaining the power cable feature as charted.[37]

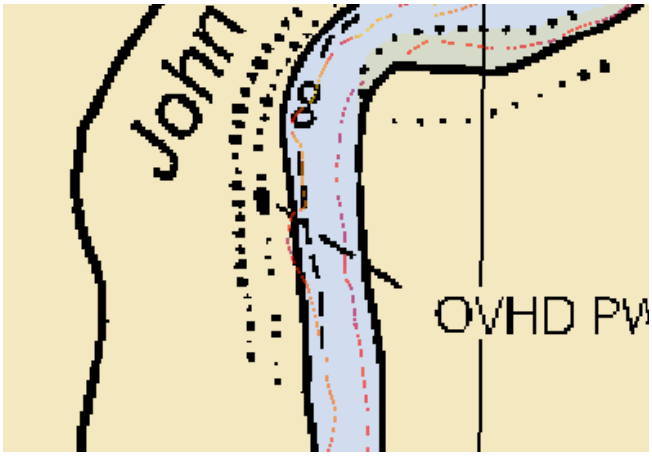


Figure 24: Charted overhead power cables (18521)

D.2.e. Submarine Cables and Pipelines

There are two cable areas charted within the limits of H11927. There is a charted cable area east of Mott Island (See Figure 25) and a charted cable area at the north entrance of John Day River (See Figure 26). There is no evidence of submerged cables in the bathymetry and none were observed within limits of hydrography. Charted depths in the cable area generally agree with the survey data. The Hydrographer recommends retaining charted cable areas and updating soundings as per digital data.[38]

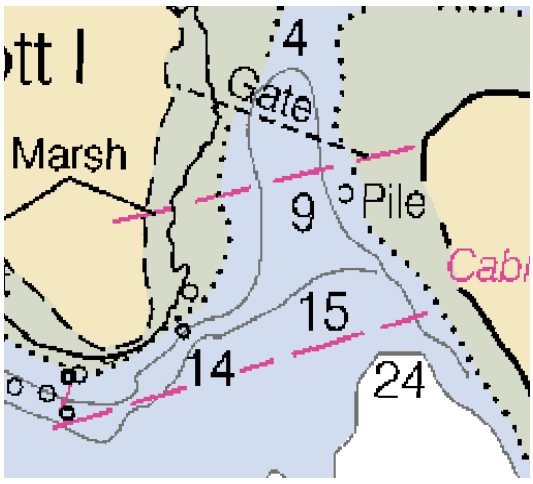


Figure 25: Cable Area 1

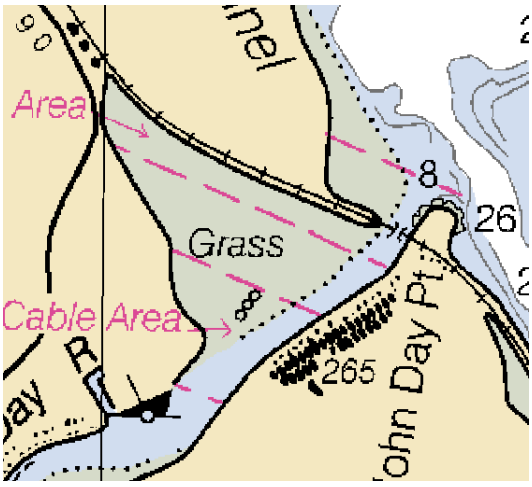


Figure 26: Cable Area 2

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11927, and none were observed to be operating in the area.[39]

D.2.g. Bottom Samples

Bottom samples were not performed in survey H11927.[40]

D.2.h. Other Findings

The Hydrographer recommends that survey H11927 be a high priority to get updates to charts 18521 & 18523 due to the number of changes in the common area.[41]

E. APPROVAL

As Chief of Party, Field operations for hydrographic survey H11927 were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports. The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual (April 2008 edition), Field Procedures Manual (May 2008 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through September 2008. These data are adequate to supersede charted data in their common areas. This survey is complete, with the exception of deficiencies noted in the Descriptive Report. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

Title	Date Sent	Office
Data Acquisition and Processing Report for OPR-N338-RA-08	5/3/2009	N/CS34
Coast Pilot Report for OPR- N338-RA-08	TBD	N/CS26

Approved and Forwarded: Donald W. Haines, CAPT/NOAA I am approving this document 2009.04.30 19:41:46 -08'00'

Captain Donald W. Haines, NOAA
Commanding Officer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Survey Sheet Manager: Jeffrey Pereira I am the author of this document 2009.04.30 20:29:43 -07'00'

Jeffrey Pereira
Ensign, NOAA

Chief Survey Technician: James B Jacobson I have reviewed this document 2009.04.30 17:29:56 -07'00'

James B. Jacobson
Chief Survey Technician, NOAA Ship *Rainier*

Field Operations Officer: I have reviewed this document 2009.04.30 18:18:37 -08'00'

Lieutenant Charles Yoos, NOAA
Field Operations Officer

[1] Do not concur, due to time constraints not all significant shoals were adequately developed by this survey. Additional hydrographic survey is recommended for this region as time and resources allow.
[2] Do not concur, single beam is used as a mainscheme source of hydrography in most of the regions of this survey.
[3] Due to very sparse coverage portions of single beam data from the buoy run shown in figure 1 were rejected during survey compilation due to inadequate survey coverage.
[4] Filed with project records.
[5] Concur.
[6] Filed with project records.
[7] The portions of overlap from H11927 were found to be deeper than the data from H11757. The deeper overlapping data from H11927 was rejected during compilation to make the eastern boundary of H11757 and western boundary of H11927 fit together.
[8] Most of the areas covered by only single beam revealed depths shoaler than what is currently charted. Despite the sparse bathymetric coverage this data was used during compilation to ensure these shoaler depths are brought forward on the next editions of the charts.
[9] A 2 meter resolution surface was used for the basis of the bathymetric compilation of H11927.
[10] Tide note is appended to this report.
[11] It is recommended that in addition to changeable areas depicted within extents of H11927_CS.000 that shoal regions surrounding the survey area be denoted as changeable also. In addition, should new source be received (aerial photography) the cautionary area depicted on the ENC should be expanded based on the new source.
[12] Concur.
[13] Concur.
[14] DTON report is appended to this report.
[15] Concur.
[16] Concur.
[17] Concur, the wing wall depicted in figure 13 is not included in H11927CS.000 and has a blue note stating “remove wing wall”.
[18] Concur, wing walls depicted in figure 14 are included in H11927CS.000 and attributed as ruined.
[19] Concur with clarification, in the positions of the four piles shown in figure 15 four obstructions with category of obstruction of snag/stump, have been added to H11927CS.000. Each obstruction’s inform field states “submerged piling”.
[20] Concur, a blue note is included in H11927CS.000 to remove the submerged piles.
[21] Concur with clarification, in the positions of the three piles shown in figure 17 three obstructions with category of obstruction of snag/stump, have been added to H11927CS.000. Each obstruction’s inform field states “submerged piling”.
[22] Concur, caution note has been added to H11927CS.000 in the region of Cathlamet Bay. Caution note for Prarie channel already exists on chart 18521.
[23] Concur.
[24] DTON report is appended to this report.
[25] Concur. Blue note has been added to remove the pile.
[26] Concur.
[27] Per end note 28 no survey feature report is appended to this report. Description of the two AWOIS items within section D.1.c is adequate.
[28] Concur.
[29] Concur with clarification, surveyed extent of boat ramp included in H11927CS.000 and a blue note has been added to remove the obstruction.
[30] The Survey Feature Report is filed with the hydrographic records. Note: the survey feature report does not include all features from H11927. Additional features were added, some removed, and some modified in CARIS Notebook after the feature report was generated from Pydro. All features included in the compilation of H11927 have come directly from CARIS Notebook, which is the official features deliverable for this survey.

[31] Filed with hydrographic records.
[32] Concur.
[33] Concur, this information was used in the compilation of H11927CS.000.
[34] Chart per latest ATONIS publication information.
[35] Concur, added blue note to H11927CS.000.
[36] Concur.
[37] Concur.
[38] Concur.
[39] Concur.
[40] All charted bottom samples from US5OR11M.000 within the limits of H11927CS.000 were retained.
[41] Concur.

H11927 DTONs Report

Registry Number: H11927

State: Oregon

Locality: Tongue Pt. to Harrington Pt.

Sub-locality: Approaches to Warrenton

Project Number: S-N338-RA-08

Survey Dates: 09/15/2008 - 03/23/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18523	56th	10/01/2006	1:40,000 (18523_1)	[L]NTM: ?
18521	73rd	04/01/2008	1:40,000 (18521_1)	[L]NTM: ?
18520	26th	10/01/2005	1:185,238 (18520_1)	[L]NTM: ?
18003	20th	11/01/2006	1:736,560 (18003_1)	[L]NTM: ?
18007	33rd	02/01/2009	1:1,200,000 (18007_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	Obstruction	1.66 m	46° 11' 24.2" N	123° 44' 17.8" W	---
1.2	Shoal	4.27 m	46° 11' 30.3" N	123° 44' 15.5" W	---
1.3	Shoal	0.58 m	46° 12' 23.9" N	123° 42' 40.9" W	---
1.4	Shoal	0.00 m	46° 10' 42.6" N	123° 40' 25.8" W	---
1.5	Shoal	2.73 m	46° 15' 54.8" N	123° 39' 48.0" W	---
1.6	Shoal	8.12 m	46° 12' 44.4" N	123° 45' 05.4" W	---
1.7	Shoal	9.17 m	46° 14' 47.9" N	123° 41' 23.4" W	---
1.8	GP	[None]	46° 12' 22.4" N	123° 42' 33.5" W	---
1.9	GP	[None]	46° 14' 29.0" N	123° 40' 57.5" W	---
1.10	GP	[None]	46° 14' 25.2" N	123° 41' 14.6" W	---

Generated by Pydro v8.7 (r2666) on Fri Jun 12 16:56:58 2009 [UTC]

1.11	GP	[None]	46° 16' 47.2" N	123° 43' 03.0" W	---
1.12	GP	[None]	46° 16' 40.0" N	123° 43' 04.1" W	---
1.13	GP	[None]	46° 16' 36.9" N	123° 43' 09.1" W	---
1.14	GP	[None]	46° 16' 36.6" N	123° 42' 11.6" W	---
1.15	Shoal	1.56 m	46° 16' 43.7" N	123° 42' 46.8" W	---
1.16	Shoal	1.30 m	46° 16' 46.9" N	123° 43' 06.9" W	---
1.17	Shoal	-0.06 m	46° 16' 19.3" N	123° 41' 58.8" W	---
1.18	Shoal	0.63 m	46° 16' 22.3" N	123° 42' 16.4" W	---
1.19	Shoal	0.41 m	46° 16' 32.7" N	123° 42' 05.2" W	---
1.20	Shoal	1.88 m	46° 16' 41.0" N	123° 42' 29.1" W	---
1.21	Shoal	0.83 m	46° 16' 37.6" N	123° 43' 04.8" W	---
1.22	Shoal	1.04 m	46° 16' 44.2" N	123° 42' 56.5" W	---
1.23	Shoal	2.52 m	46° 16' 05.1" N	123° 41' 39.6" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 472/94 from h11927 / 1021_reson8101_hvf / 2008-264 / 000_1839

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 11' 24.2" N, 123° 44' 17.8" W

Least Depth: 1.66 m (= 5.45 ft = 0.909 fm = 0 fm 5.45 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.377 m ; **TVU (TPEv)** ±0.156 m

Timestamp: 2008-264.18:40:17.872 (09/20/2008)

Survey Line: h11927 / 1021_reson8101_hvf / 2008-264 / 000_1839

Profile/Beam: 472/94

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Shoalest of 5 contacts, possible piles/ruins- covered with 8101 mainscheme.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1021_reson8101_hvf/2008-264/000_1839	472/94	0.00	000.0	Primary
h11927/2802_klein5k_100_hvf/2008-265/sonar_data080921221500	0001	10.73	353.8	Secondary

Hydrographer Recommendations

Chart "Obstructions" with a least depth of 5 ft with a 60 m radius centered on this feature's position.

Cartographically-Rounded Depth (Affected Charts):

5ft (18521_1)

0 ¾fm (18520_1, 18003_1, 18007_1, 530_1)

1.7m (501_1, 50_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

VALSOU - 1.662 m

WATLEV - 3:always under water/submerged

Office Notes

Concur.

Feature Images

Figure 1.1.1

1.2) Profile/Beam - 1459/80 from h11927 / 1021_reson8101_hvf / 2008-264 / 000_1931

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 11' 30.3" N, 123° 44' 15.5" W

Least Depth: 4.27 m (= 14.00 ft = 2.333 fm = 2 fm 2.00 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.376 m ; **TVU (TPEv)** ±0.160 m

Timestamp: 2008-264.19:32:49.055 (09/20/2008)

Survey Line: h11927 / 1021_reson8101_hvf / 2008-264 / 000_1931

Profile/Beam: 1459/80

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Shoal area discovered with MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1021_reson8101_hvf/2008-264/000_1931	1459/80	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data. (18521)

Cartographically-Rounded Depth (Affected Charts):

14ft (18521_1)

2 ¼fm (18520_1, 18003_1, 18007_1, 530_1)

4.3m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Office Notes

Do not concur. Chart 12 ft. sounding at 46-11-27.9N, 123-44-14.61W instead.

Feature Images

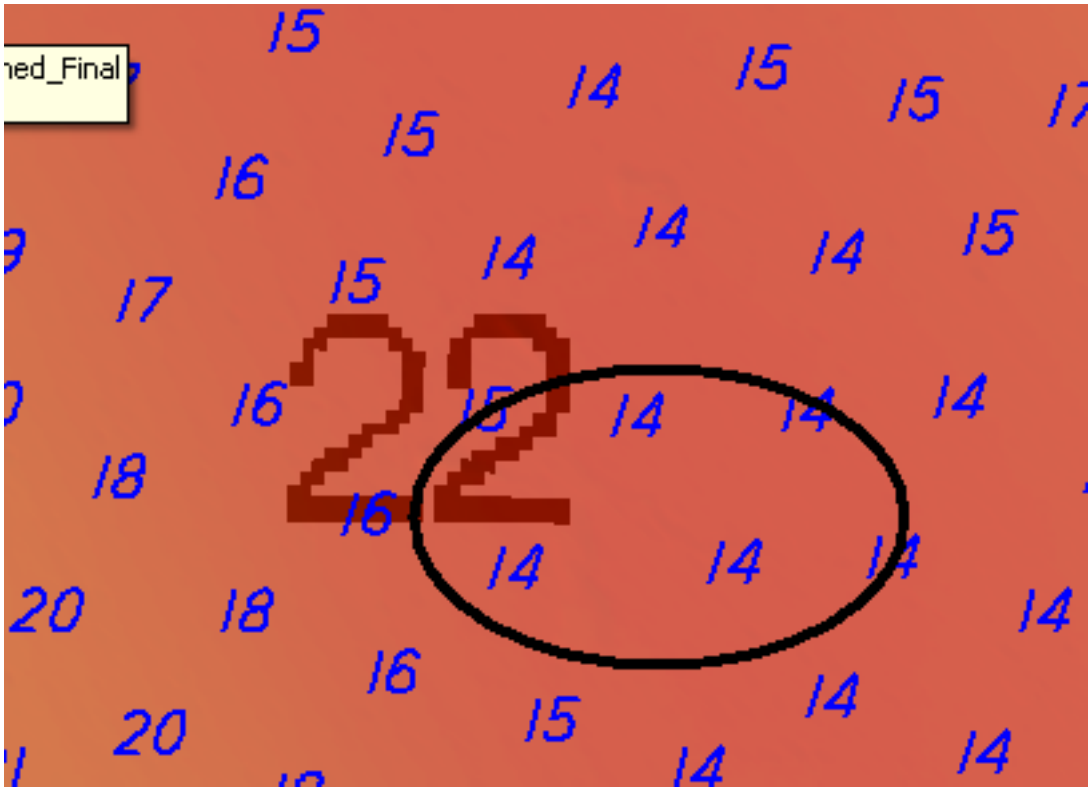


Figure 1.2.1

1.3) Profile/Beam - 953/1 from h11927 / 1101_singlebeam_hvf / 2008-266 / 067_2137

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 12' 23.9" N, 123° 42' 40.9" W

Least Depth: 0.58 m (= 1.92 ft = 0.320 fm = 0 fm 1.92 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.921 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.21:41:13.428 (09/22/2008)

Survey Line: h11927 / 1101_singlebeam_hvf / 2008-266 / 067_2137

Profile/Beam: 953/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Shoal area discovered with VBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1101_singlebeam_hvf/2008-266/067_2137	953/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data (18521)

Cartographically-Rounded Depth (Affected Charts):

2ft (18521_1)

0 ¼fm (18520_1, 18003_1, 18007_1, 530_1)

.6m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 1:found by echo-sounder

VERDAT - 12:Mean lower low water

Office Notes

Concur.

Feature Images

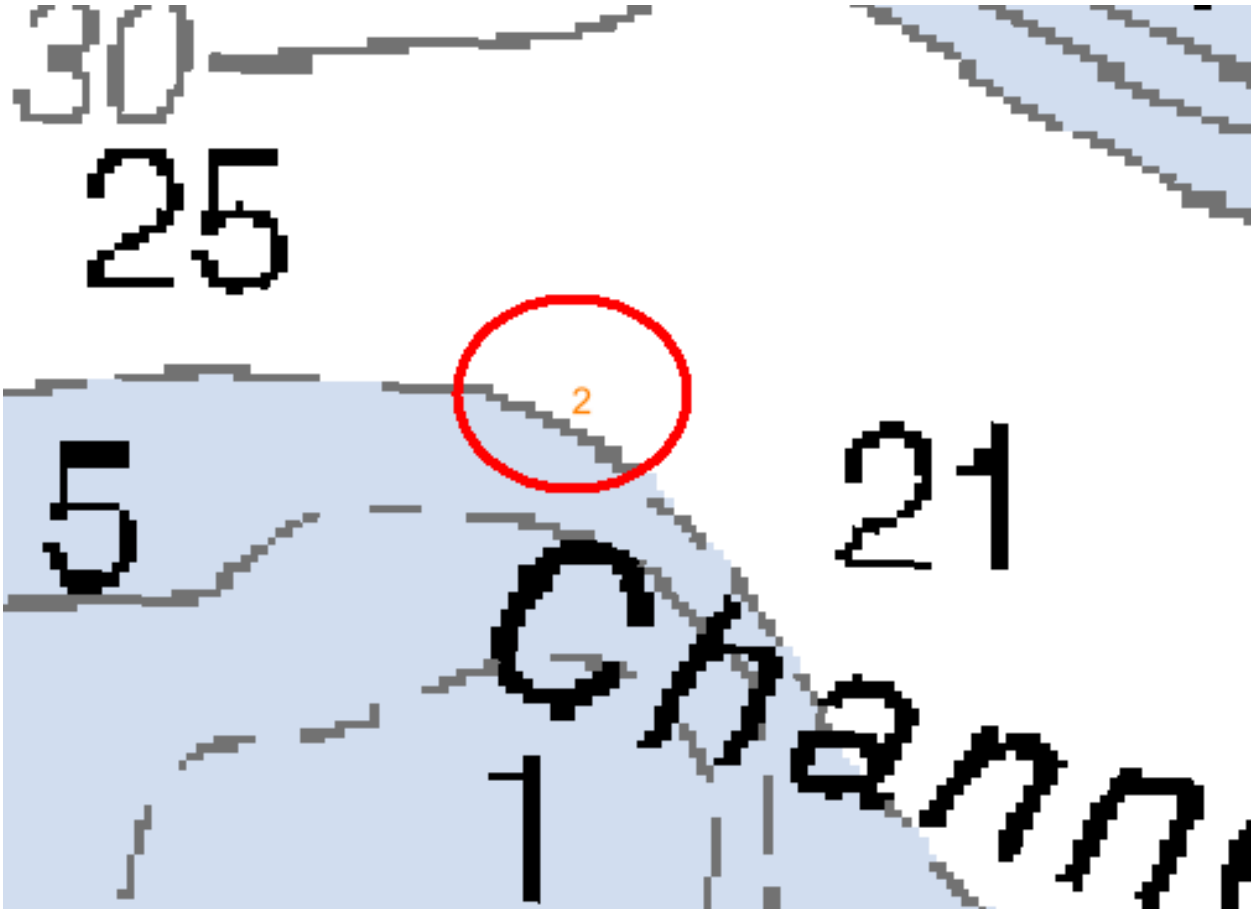


Figure 1.3.1

1.4) Profile/Beam - 208/1 from h11927 / 1103_singlebeam_hvf / 2008-264 / 000_1629

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 10' 42.6" N, 123° 40' 25.8" W

Least Depth: 0.00 m (= 0.00 ft = 0.000 fm = 0 fm 0.00 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.921 m ; **TVU (TPEv)** ±0.310 m

Timestamp: 2008-264.16:29:46.991 (09/20/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-264 / 000_1629

Profile/Beam: 208/1

Charts Affected: 18521_1, 18523_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

"We found bottom." Shoal area discovere with VBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-264/000_1629	208/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data (18521,18523)

Cartographically-Rounded Depth (Affected Charts):

0ft (18521_1, 18523_1)

0fm (18520_1, 18003_1, 18007_1, 530_1)

.0m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 1:found by echo-sounder

VERDAT - 12:Mean lower low water

Office Notes

Concur with clarification, chart area as MLLW as is depicted in H11927CS.000.

Feature Images

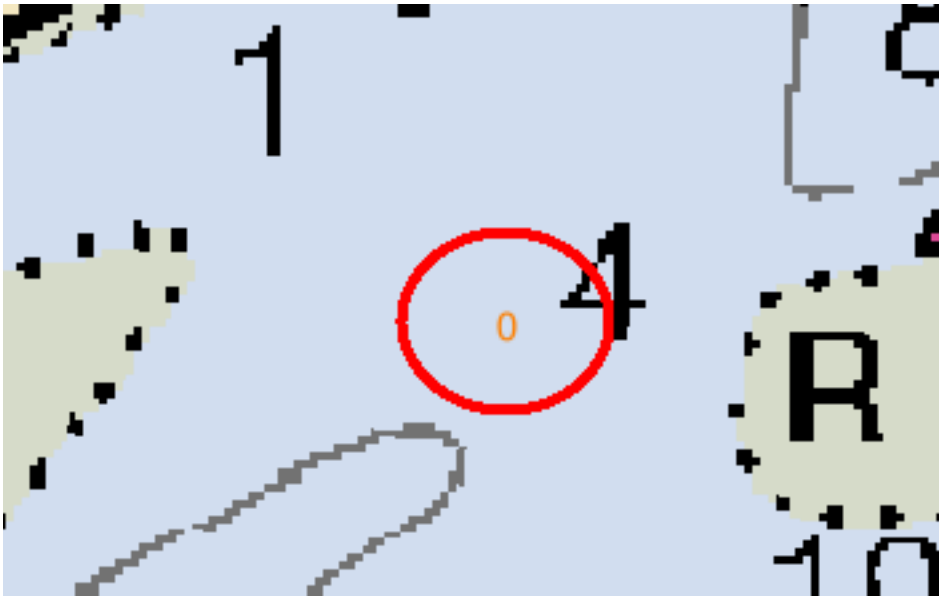


Figure 1.4.1

1.5) Profile/Beam - 1477/1 from h11927 / 1103_singlebeam_hvf / 2008-267 / 025_1758

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 15' 54.8" N, 123° 39' 48.0" W

Least Depth: 2.73 m (= 8.96 ft = 1.493 fm = 1 fm 2.96 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.928 m ; **TVU (TPEv)** ±0.312 m

Timestamp: 2008-267.18:00:07.417 (09/23/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-267 / 025_1758

Profile/Beam: 1477/1

Charts Affected: 18521_1, 18523_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Shoal area discovered with VBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-267/025_1758	1477/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data (18521,18523)

Cartographically-Rounded Depth (Affected Charts):

9ft (18521_1, 18523_1)

1 ½fm (18520_1, 18003_1, 18007_1, 530_1)

2.7m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 1:found by echo-sounder

VERDAT - 12:Mean lower low water

Office Notes

Concur.

Feature Images

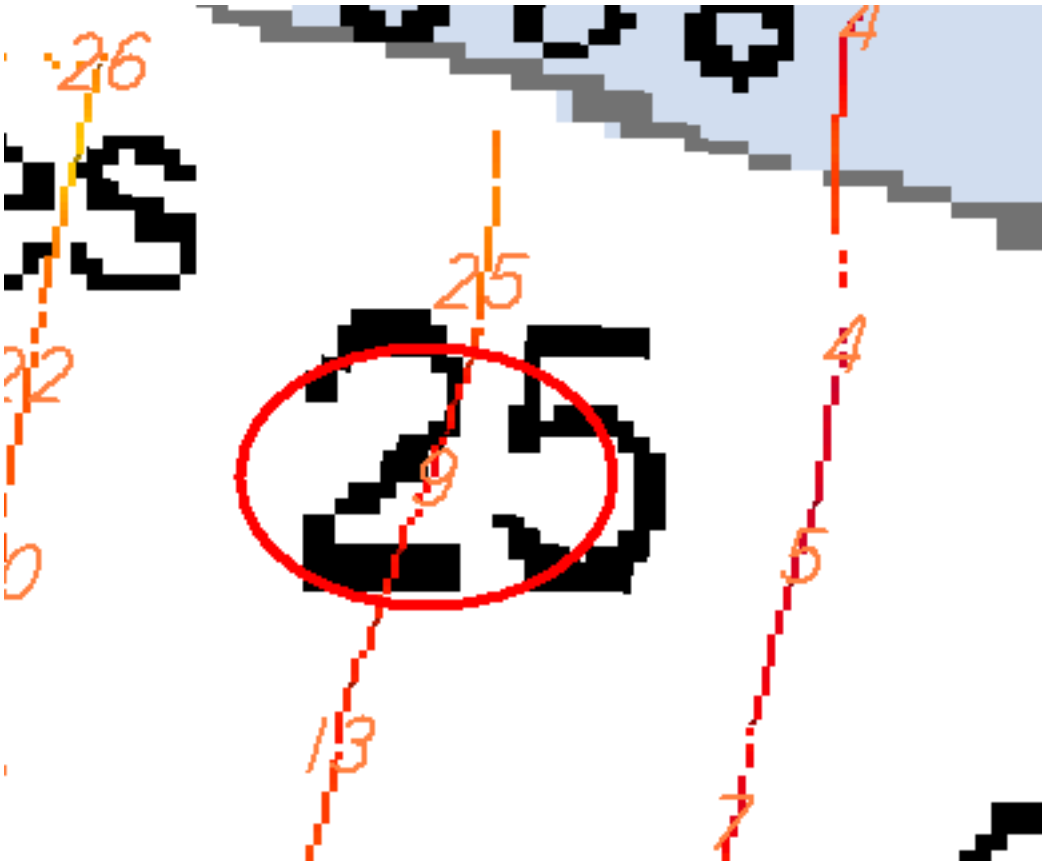


Figure 1.5.1

1.6) Profile/Beam - 1125/40 from h11927 / 2801_reson7125_lf_256beams / 2008-259 / 259-1709

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 12' 44.4" N, 123° 45' 05.4" W

Least Depth: 8.12 m (= 26.63 ft = 4.439 fm = 4 fm 2.63 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.974 m ; **TVU (TPEv)** ±0.334 m

Timestamp: 2008-259.17:11:21.910 (09/15/2008)

Survey Line: h11927 / 2801_reson7125_lf_256beams / 2008-259 / 259-1709

Profile/Beam: 1125/40

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

High point of shoal area discovered with MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/2801_reson7125_lf_256beams/2008-259/259-1709	1125/40	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data (18521)

Cartographically-Rounded Depth (Affected Charts):

26ft (18521_1)

4 ½fm (18520_1, 18003_1, 18007_1, 530_1)

8.1m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Office Notes

Concur.

Feature Images

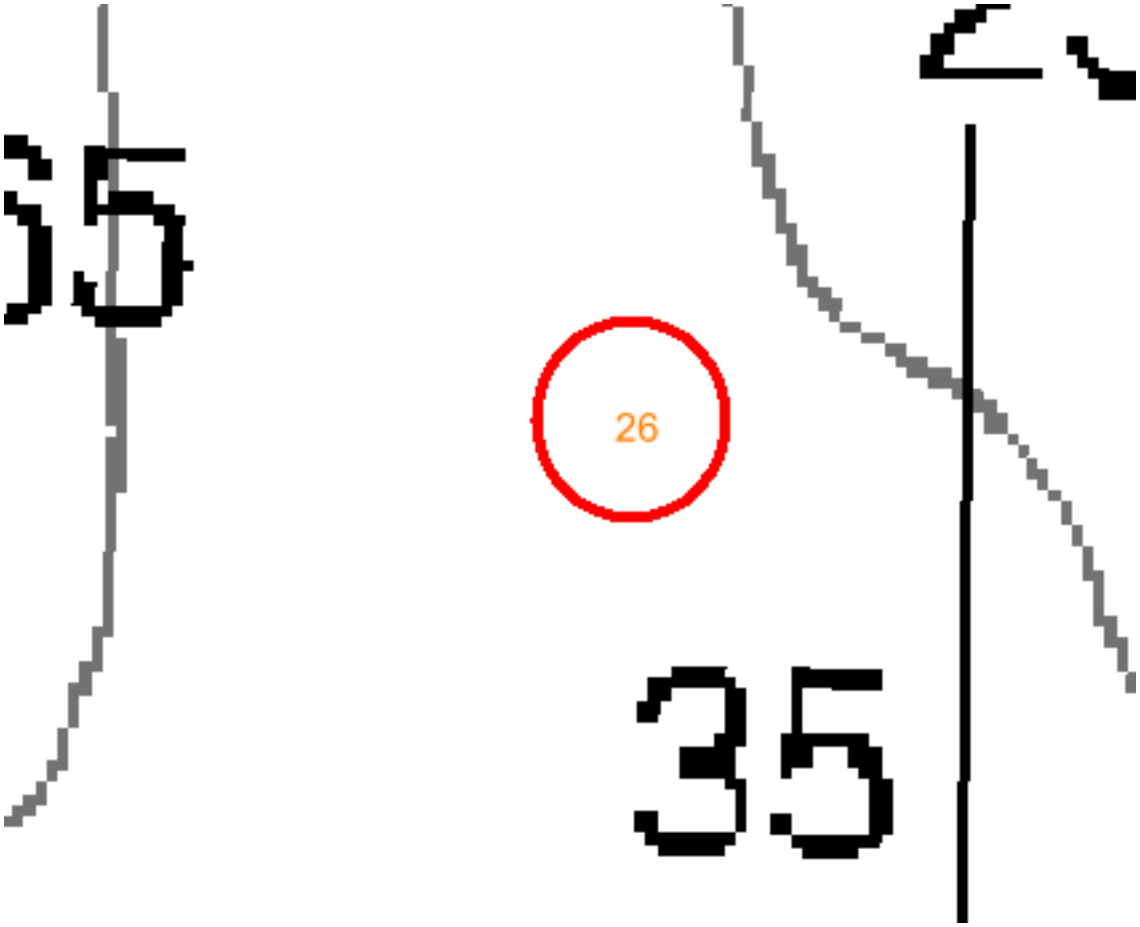


Figure 1.6.1

1.7) Profile/Beam - 883/254 from h11927 / 2802_reson7125_hf_256beams / 2008-263 / 263-1746

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 14' 47.9" N, 123° 41' 23.4" W

Least Depth: 9.17 m (= 30.09 ft = 5.014 fm = 5 fm 0.09 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.978 m ; **TVU (TPEv)** ±0.338 m

Timestamp: 2008-263.17:47:38.624 (09/19/2008)

Survey Line: h11927 / 2802_reson7125_hf_256beams / 2008-263 / 263-1746

Profile/Beam: 883/254

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

High point of sand wave discovered with MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/2802_reson7125_hf_256beams/2008-263/263-1746	883/254	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data (18521)

Cartographically-Rounded Depth (Affected Charts):

30ft (18521_1)

5fm (18520_1, 18003_1, 18007_1, 530_1)

9.2m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

QUASOU - 1:depth known

SORDAT - 20080923

SORIND - US,US,nsurf,H11927

TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Office Notes

Concur.

Feature Images

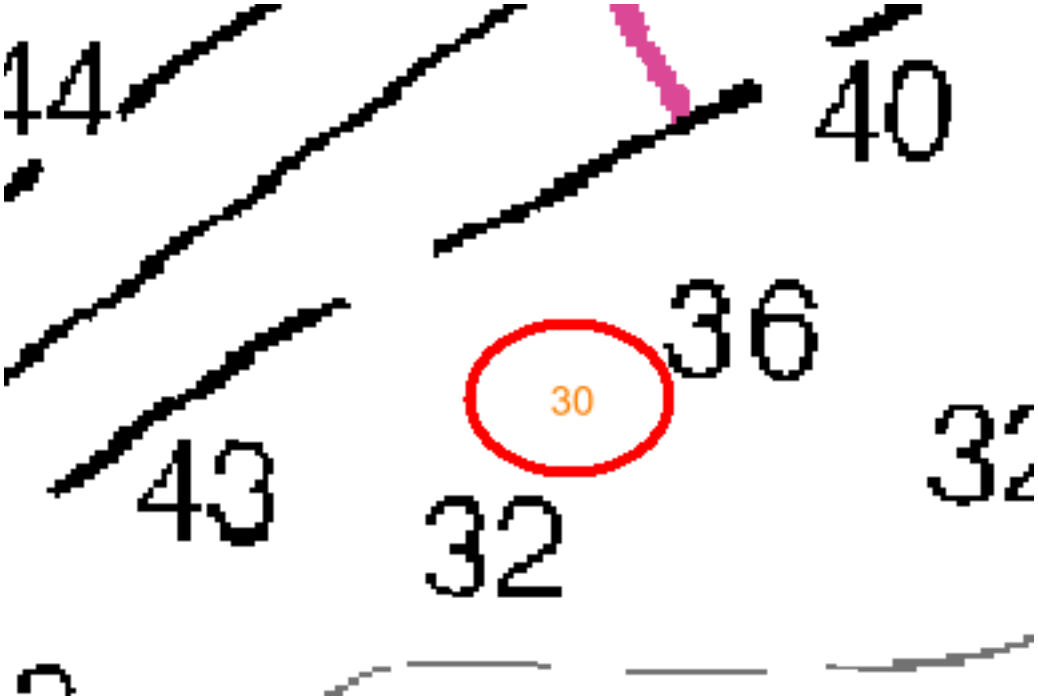


Figure 1.7.1

1.8) GP No. - 1 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 12' 22.4" N, 123° 42' 33.5" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-079.08:54:14 (03/20/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. 21 foot charted depth not discovered with VBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	1	0.00	000.0	Primary

Hydrographer Recommendations

Remove 21 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

Figure 1.8.1

1.9) GP No. - 2 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 14' 29.0" N, 123° 40' 57.5" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-079.08:55:19 (03/20/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 2

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. 25 foot charted depth not discovered with MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	2	0.00	000.0	Primary

Hydrographer Recommendations

Remove 25 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

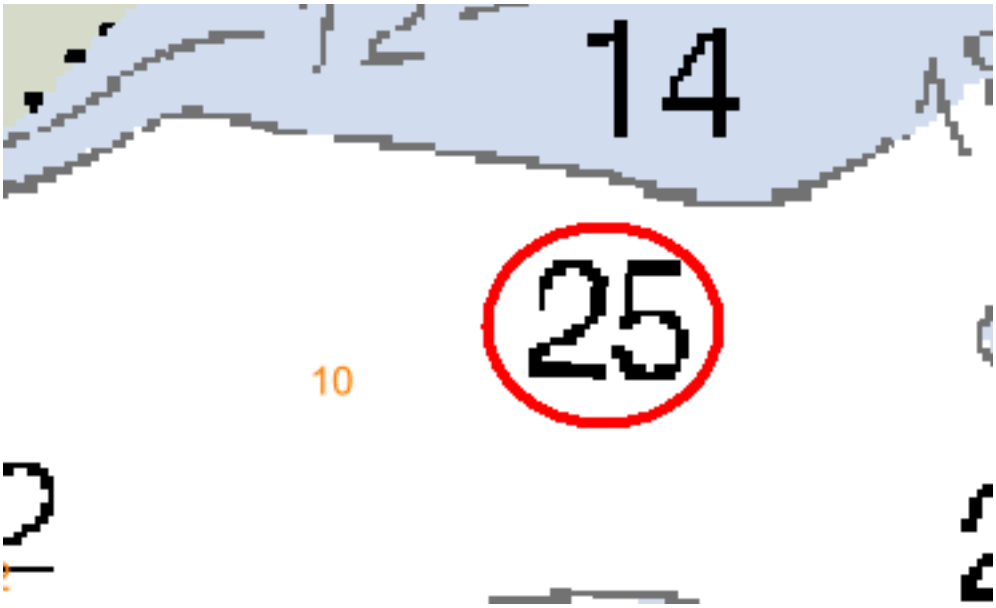


Figure 1.9.1

1.10) GP No. - 3 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 14' 25.2" N, 123° 41' 14.6" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-079.08:55:25 (03/20/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 3

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. 22 foot charted depth not discovered with MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	3	0.00	000.0	Primary

Hydrographer Recommendations

Remove 22 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

Figure 1.10.1

1.11) GP No. - 4 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 47.2" N, 123° 43' 03.0" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-082.10:57:55 (03/23/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 4

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. The 8-foot charted depth is roughly 4-feet deeper than the surveyed soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	4	0.00	000.0	Primary

Hydrographer Recommendations

Remove 8 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

1.12) GP No. - 5 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 40.0" N, 123° 43' 04.1" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-082.10:58:33 (03/23/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 5

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. The 11-foot charted depth is roughly 7-feet deeper than the surveyed soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	5	0.00	000.0	Primary

Hydrographer Recommendations

Remove 11 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

1.13) GP No. - 6 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 36.9" N, 123° 43' 09.1" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-082.10:58:42 (03/23/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 6

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. The 13-foot charted depth is roughly 11-feet deeper than the surveyed soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	6	0.00	000.0	Primary

Hydrographer Recommendations

Remove 13 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

1.14) GP No. - 7 from ChartGPs - Digitized

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 36.6" N, 123° 42' 11.6" W

Least Depth: [None]

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2009-082.10:59:08 (03/23/2009)

GP Dataset: ChartGPs - Digitized

GP No.: 7

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

ANTI DTON-Sharp discrepancies between survey soundings and charted depths. The 22-foot charted depth is roughly 18-feet deeper than the surveyed soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	7	0.00	000.0	Primary

Hydrographer Recommendations

Remove 22 foot charted depth and chart as per digital data (18521)

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

1.15) Profile/Beam - 167/1 from h11927 / 1101_singlebeam_hvf / 2008-267 / 021_2125

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 43.7" N, 123° 42' 46.8" W

Least Depth: 1.56 m (= 5.11 ft = 0.852 fm = 0 fm 5.11 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.924 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-267.21:26:59.999 (09/23/2008)

Survey Line: h11927 / 1101_singlebeam_hvf / 2008-267 / 021_2125

Profile/Beam: 167/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1101_singlebeam_hvf/2008-267/021_2125	167/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

5ft (18521_1)

0 ¾fm (18520_1, 18003_1, 18007_1, 530_1)

1.6m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

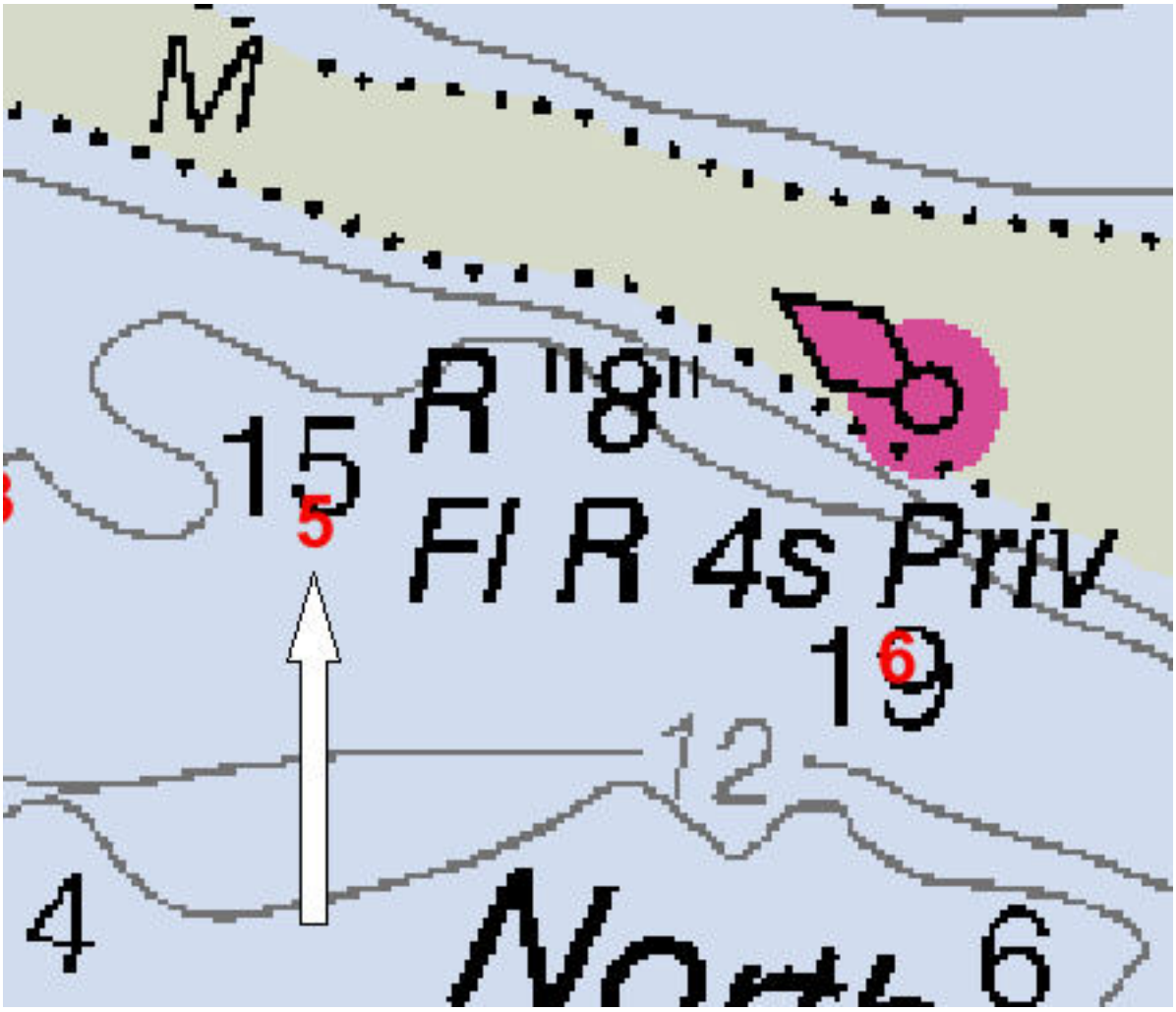


Figure 1.15.1

1.16) Profile/Beam - 465/1 from h11927 / 1101_singlebeam_hvf / 2008-267 / 021_2125

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 46.9" N, 123° 43' 06.9" W

Least Depth: 1.30 m (= 4.27 ft = 0.711 fm = 0 fm 4.27 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.923 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-267.21:29:10.415 (09/23/2008)

Survey Line: h11927 / 1101_singlebeam_hvf / 2008-267 / 021_2125

Profile/Beam: 465/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1101_singlebeam_hvf/2008-267/021_2125	465/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

4ft (18521_1)

0 ¾fm (18520_1, 18003_1, 18007_1, 530_1)

1.3m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

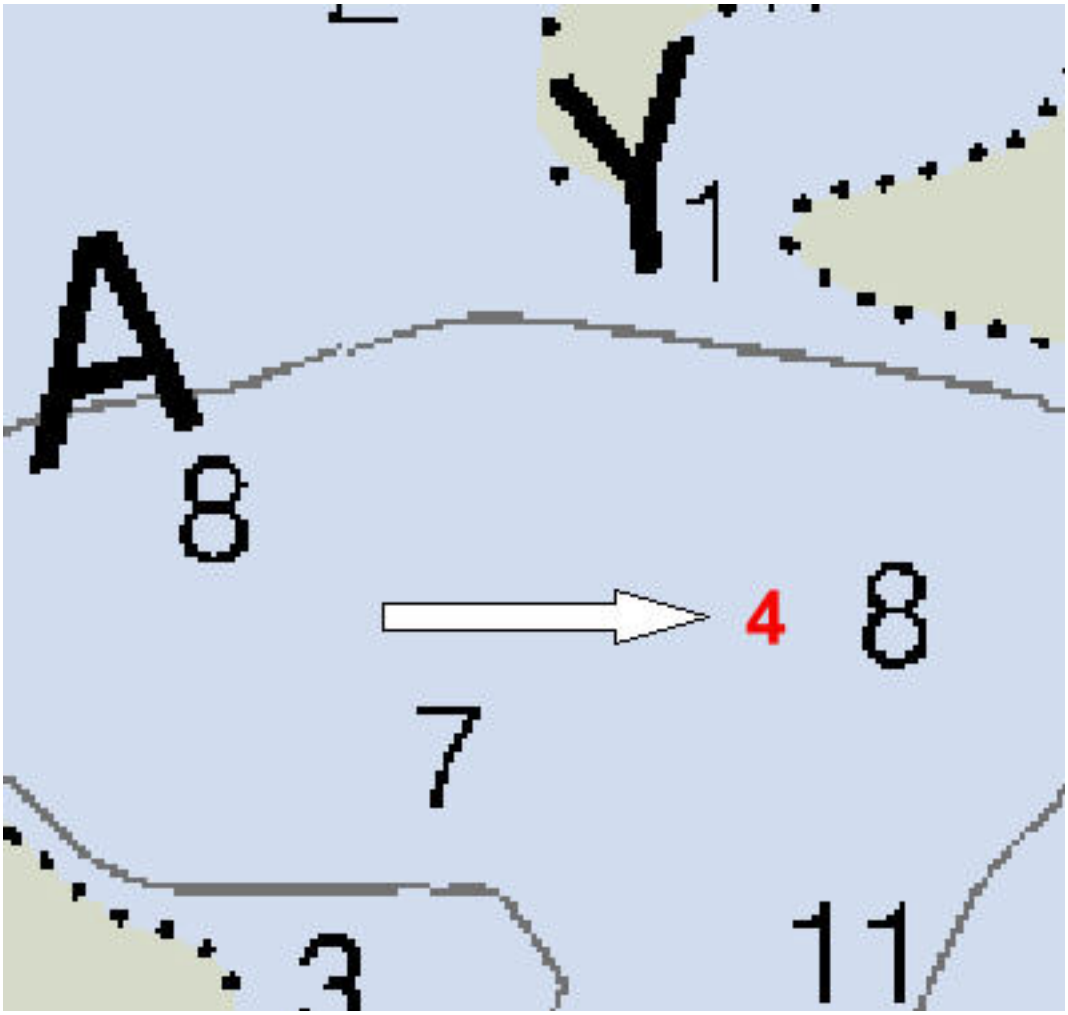


Figure 1.16.1

1.17) Profile/Beam - 39/1 from h11927 / 1103_singlebeam_hvf / 2008-266 / 129_2150

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 19.3" N, 123° 41' 58.8" W

Least Depth: -0.06 m (= -0.21 ft = -0.034 fm = 0 fm 5.79 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.921 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.21:51:00.304 (09/22/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-266 / 129_2150

Profile/Beam: 39/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-266/129_2150	39/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

0ft (18521_1)

0fm (18520_1, 18003_1, 18007_1, 530_1)

-.1m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur with clarification, chart area as MLLW as is depicted in H11927CS.000.

Feature Images

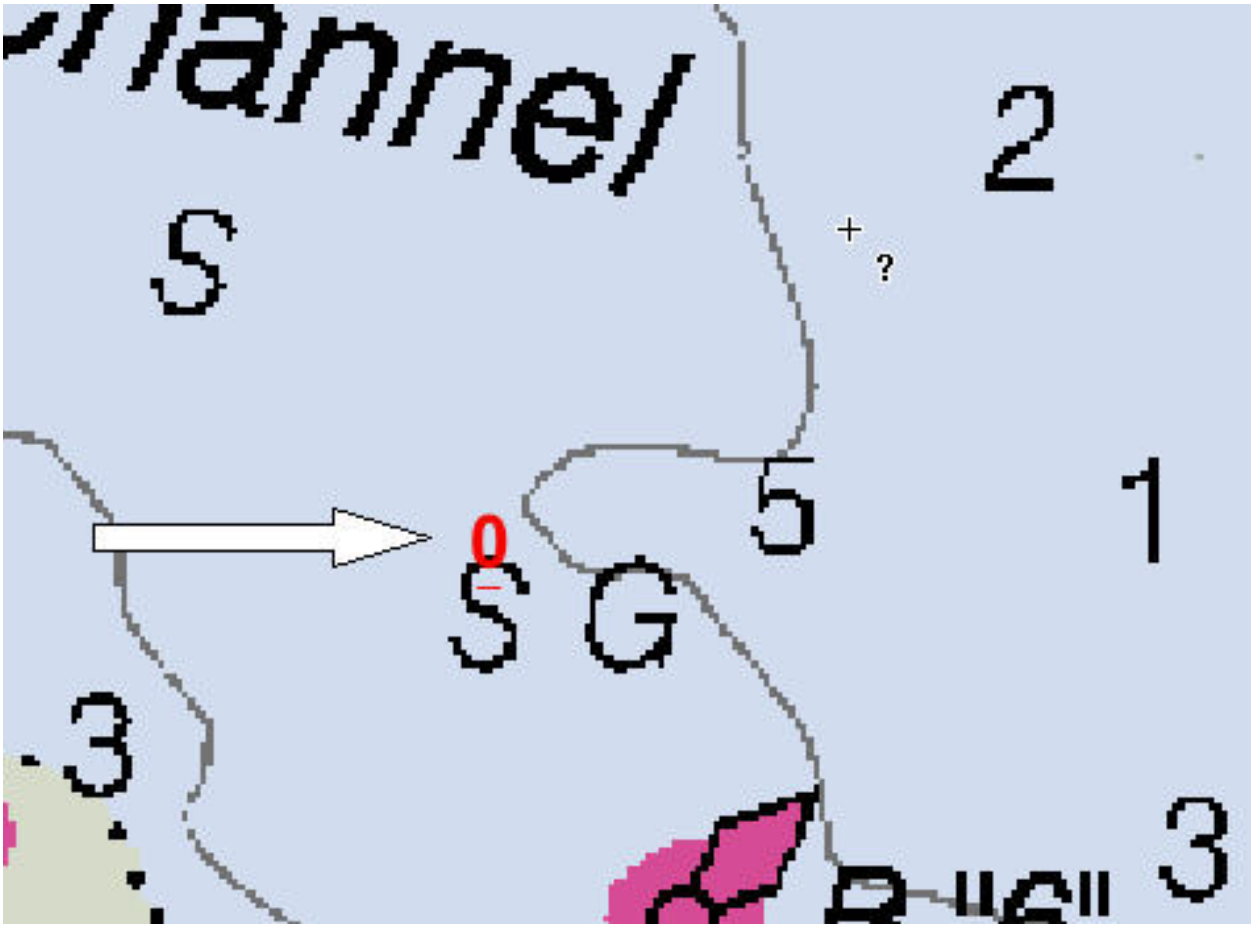


Figure 1.17.1

1.18) Profile/Beam - 1570/1 from h11927 / 1103_singlebeam_hvf / 2008-266 / 130_2152

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 22.3" N, 123° 42' 16.4" W

Least Depth: 0.63 m (= 2.06 ft = 0.343 fm = 0 fm 2.06 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.922 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.21:54:33.597 (09/22/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-266 / 130_2152

Profile/Beam: 1570/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-266/130_2152	1570/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

2ft (18521_1)

0 ¼fm (18520_1, 18003_1, 18007_1, 530_1)

.6m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Do not concur. Chart 1 ft. sounding at 46-16-22.57N, 123-42-15.0W instead.

Feature Images

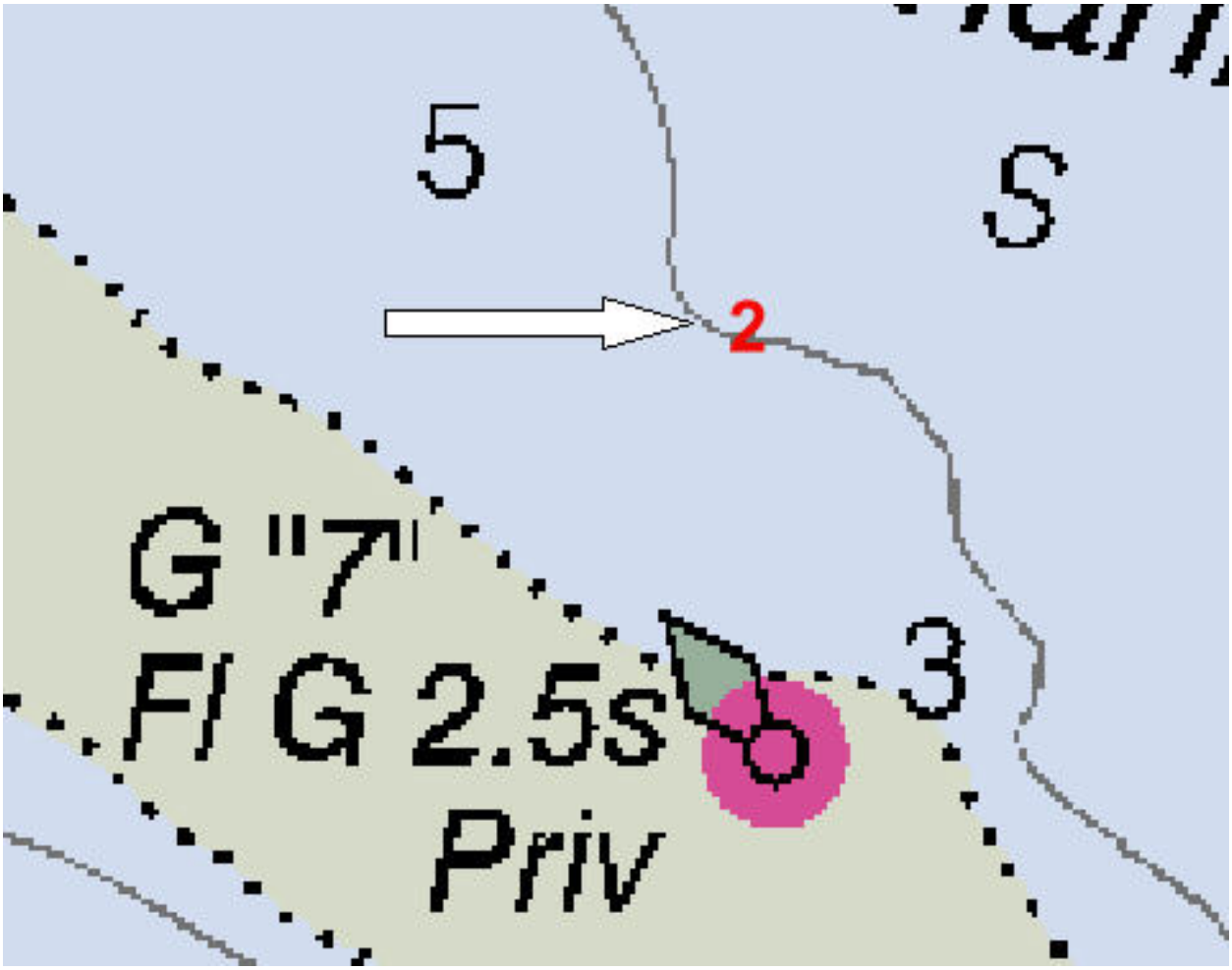


Figure 1.18.1

1.19) Profile/Beam - 2928/1 from h11927 / 1103_singlebeam_hvf / 2008-266 / 132_2158

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 32.7" N, 123° 42' 05.2" W

Least Depth: 0.41 m (= 1.34 ft = 0.223 fm = 0 fm 1.34 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.922 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.22:02:24.794 (09/22/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-266 / 132_2158

Profile/Beam: 2928/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-266/132_2158	2928/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

1ft (18521_1)

0 ¼fm (18520_1, 18003_1, 18007_1, 530_1)

.4m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

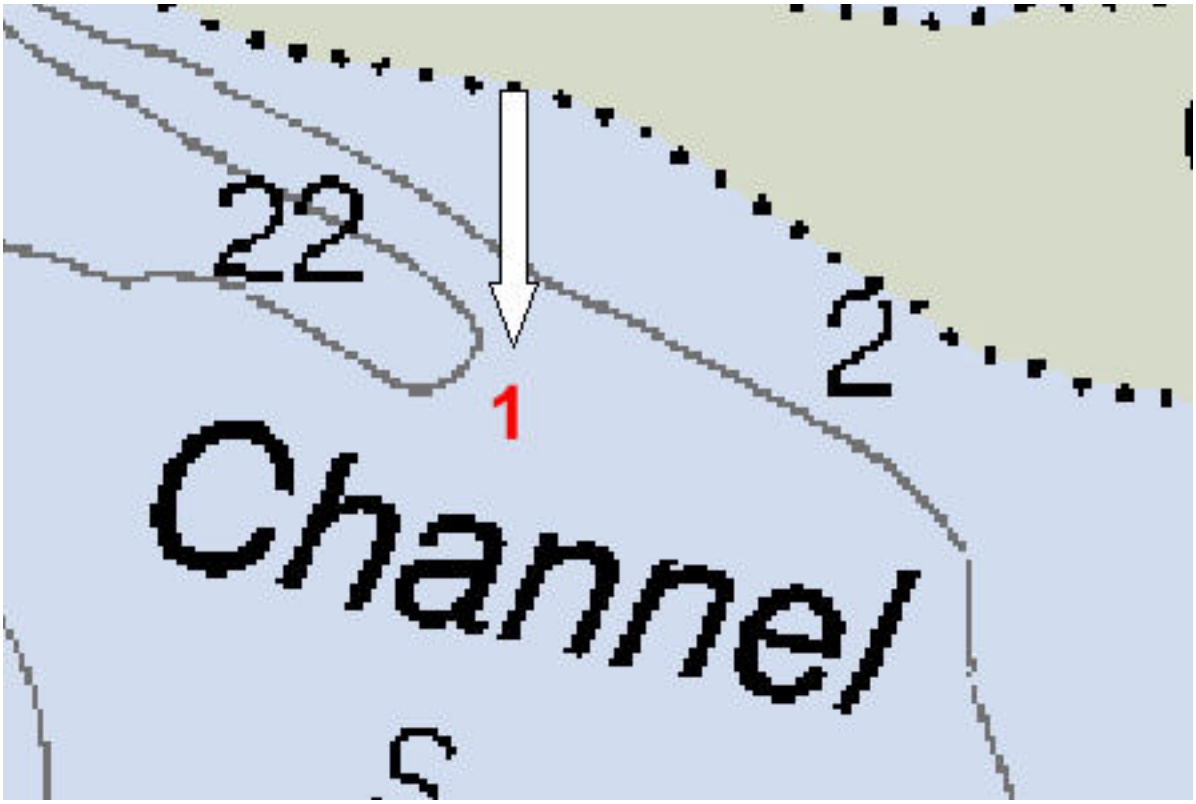


Figure 1.19.1

1.20) Profile/Beam - 2477/1 from h11927 / 1103_singlebeam_hvf / 2008-266 / 135_2211

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 41.0" N, 123° 42' 29.1" W

Least Depth: 1.88 m (= 6.17 ft = 1.028 fm = 1 fm 0.17 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.924 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.22:14:17.034 (09/22/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-266 / 135_2211

Profile/Beam: 2477/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-266/135_2211	2477/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

6ft (18521_1)

1fm (18520_1, 18003_1, 18007_1, 530_1)

1.9m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Do not concur, chart shoaler soundings in vicinity as depicted in H11927CS.000.

Feature Images

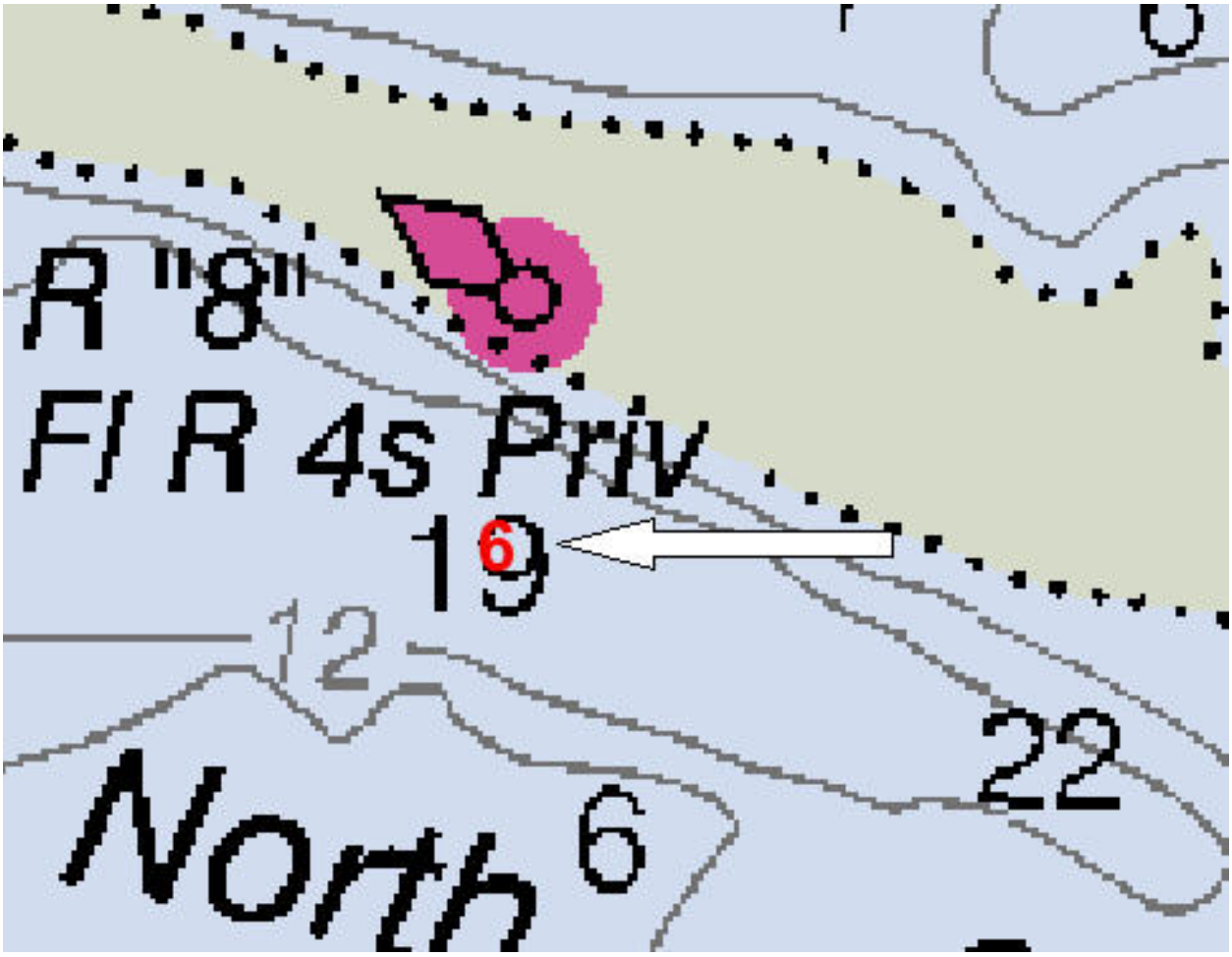


Figure 1.20.1

1.21) Profile/Beam - 526/1 from h11927 / 1103_singlebeam_hvf / 2008-266 / 142_2235

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 37.6" N, 123° 43' 04.8" W

Least Depth: 0.83 m (= 2.74 ft = 0.456 fm = 0 fm 2.74 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.922 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-266.22:36:29.284 (09/22/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-266 / 142_2235

Profile/Beam: 526/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-266/142_2235	526/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

2ft (18521_1)

0 ½fm (18520_1, 18003_1, 18007_1, 530_1)

.8m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

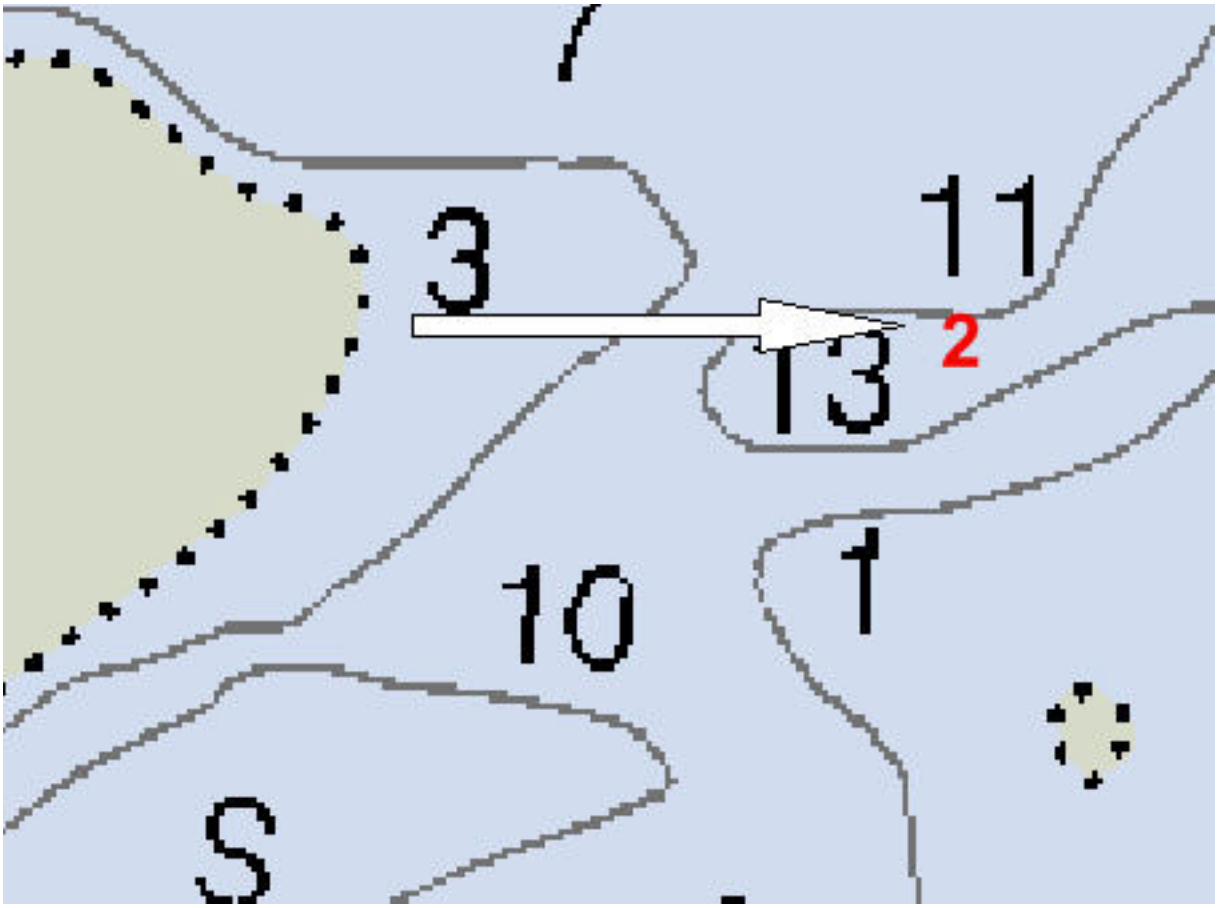


Figure 1.21.1

1.22) Profile/Beam - 669/1 from h11927 / 1103_singlebeam_hvf / 2008-267 / 015_2007

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 44.2" N, 123° 42' 56.5" W

Least Depth: 1.04 m (= 3.42 ft = 0.569 fm = 0 fm 3.42 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.923 m ; **TVU (TPEv)** ±0.311 m

Timestamp: 2008-267.20:08:04.325 (09/23/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-267 / 015_2007

Profile/Beam: 669/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-267/015_2007	669/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

3ft (18521_1)

0 ½fm (18520_1, 18003_1, 18007_1, 530_1)

1.0m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

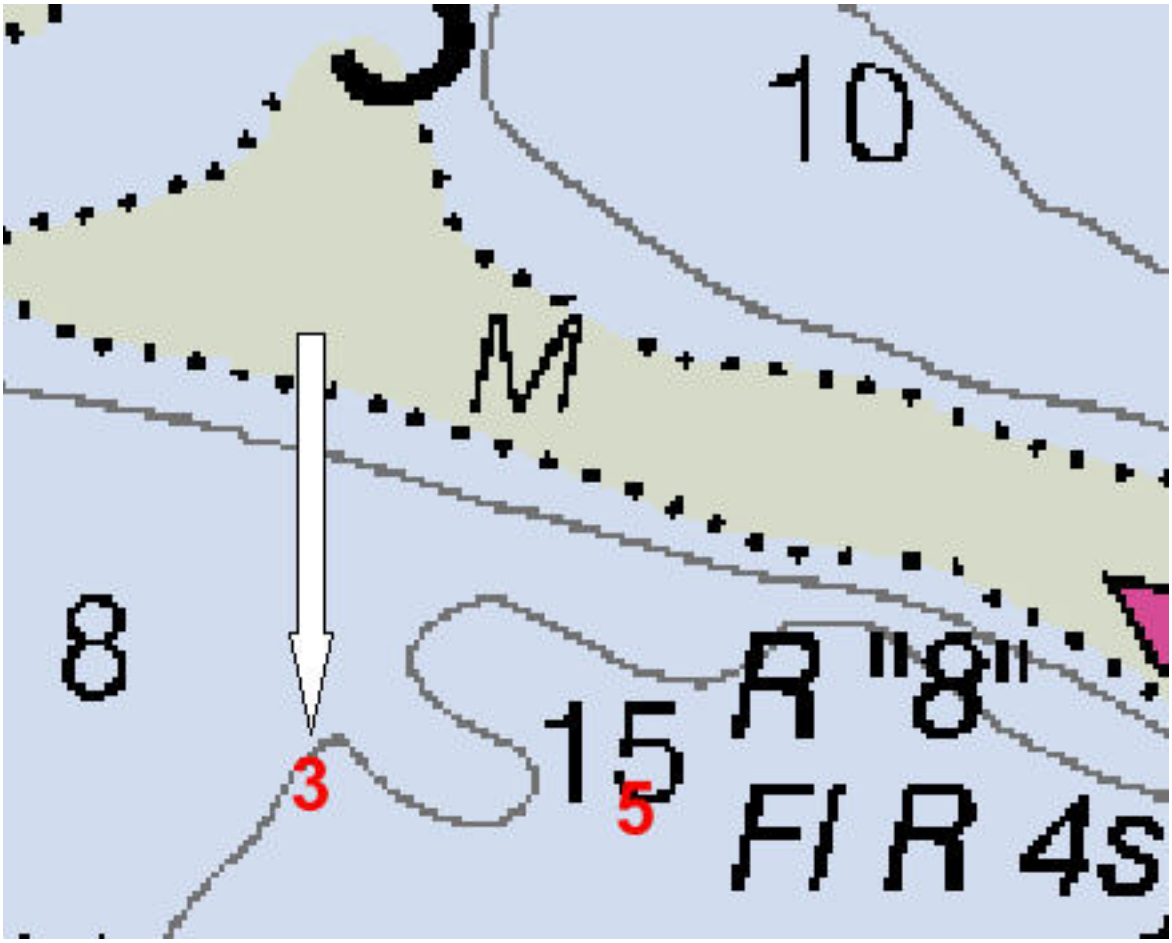


Figure 1.22.1

1.23) Profile/Beam - 1559/1 from h11927 / 1103_singlebeam_hvf / 2008-267 / 041_1934

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 16' 05.1" N, 123° 41' 39.6" W

Least Depth: 2.52 m (= 8.26 ft = 1.377 fm = 1 fm 2.26 ft)

TPU (±1.96σ): **THU (TPEh)** ±3.926 m ; **TVU (TPEv)** ±0.312 m

Timestamp: 2008-267.19:36:20.948 (09/23/2008)

Survey Line: h11927 / 1103_singlebeam_hvf / 2008-267 / 041_1934

Profile/Beam: 1559/1

Charts Affected: 18521_1, 18520_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

DTON found with VBES

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11927/1103_singlebeam_hvf/2008-267/041_1934	1559/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data

Cartographically-Rounded Depth (Affected Charts):

8ft (18521_1)

1 ¼fm (18520_1, 18003_1, 18007_1, 530_1)

2.5m (501_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORDAT - 20080923

SORIND - US,US,nsurf,H11927

Office Notes

Concur.

Feature Images

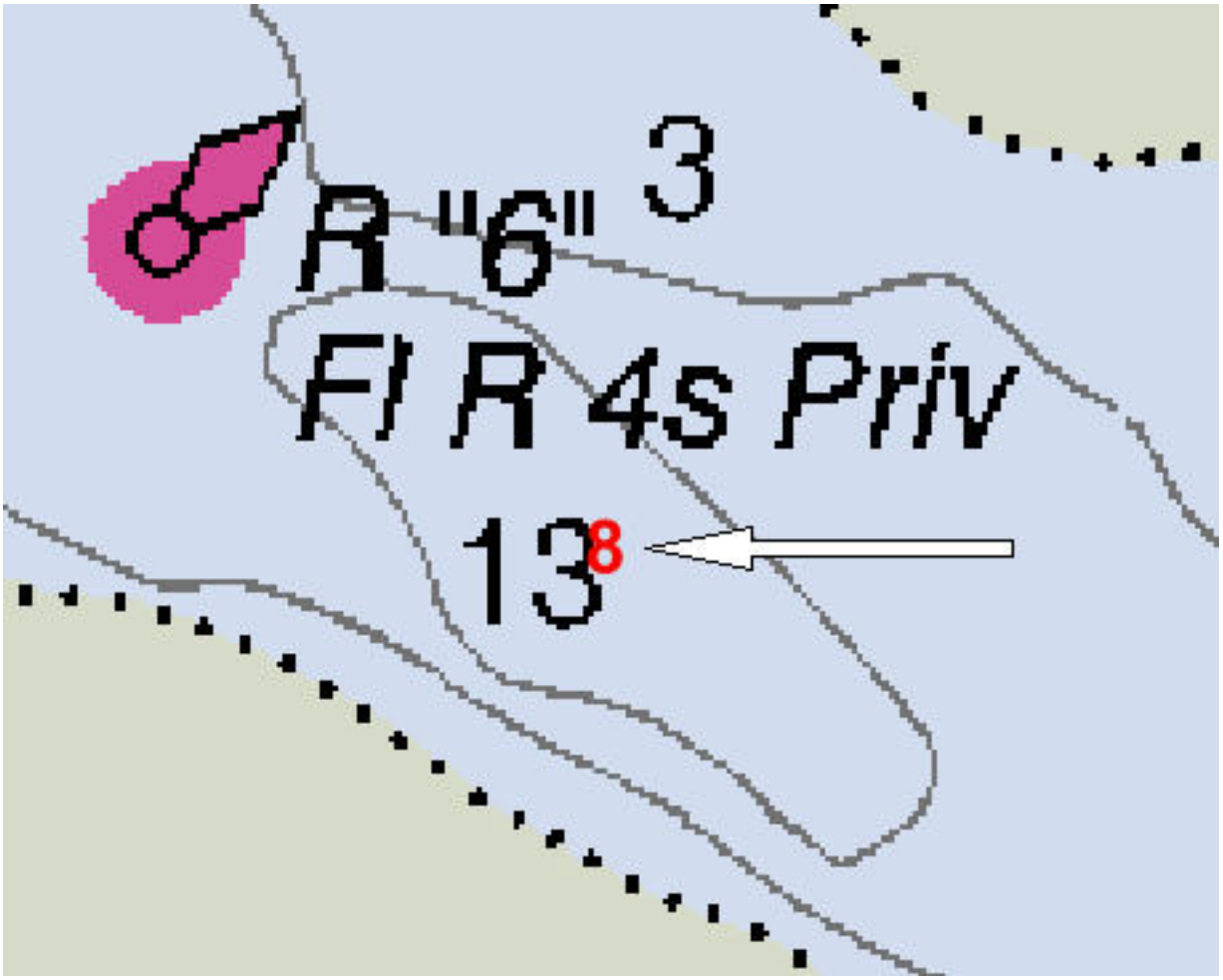


Figure 1.23.1

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 7, 2008

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-N338-RA-2008
HYDROGRAPHIC SHEET: H11927

LOCALITY: Tongue Pt. to Harrington Pt., Approaches to Warrenton, OR
TIME PERIOD: September 15 -23, 2008

TIDE STATION USED: 943-9040 Astoria, OR
Lat. 46° 12.4'N Long. 123° 46.1' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.418 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-N338-RA-2008, H11927, during the time period between September 15 and 23, 2008

Please use the zoning file "N338RA2008CORP" submitted with the project instructions for OPR-N338-RA-2008. Zones CR15, CR16, CR17, CR18 and CR19 are the applicable zones for H11927.

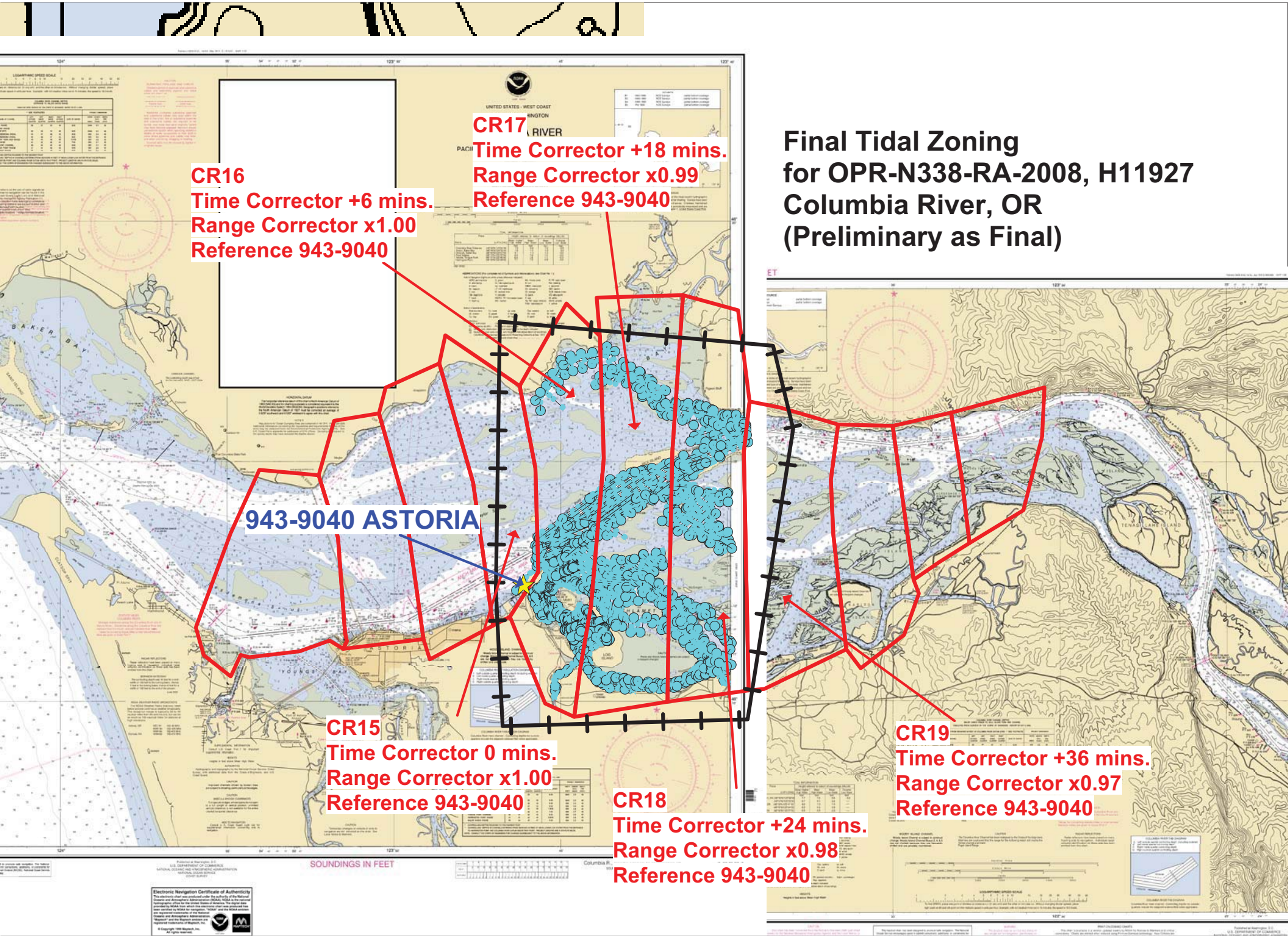
Refer to attachments for zoning information.

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).

Peter J. Stone

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/NOS, email=peter.stone@noaa.gov, c=US
Date: 2008.10.10 14:08:52 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION


Final Tidal Zoning
for OPR-N338-RA-2008, H11927
Columbia River, OR
(Preliminary as Final)
CR16
Time Corrector +6 mins.
Range Corrector x1.00
Reference 943-9040
CR17
Time Corrector +18 mins.
Range Corrector x0.99
Reference 943-9040
943-9040 ASTORIA
CR15
Time Corrector 0 mins.
Range Corrector x1.00
Reference 943-9040
CR18
Time Corrector +24 mins.
Range Corrector x0.98
Reference 943-9040
CR19
Time Corrector +36 mins.
Range Corrector x0.97
Reference 943-9040
SOUNDINGS IN FEET

H11927 HCell Report

Peter Holmberg, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to provide new survey information in International Hydrographic Organization (IHO) format S-57 to update the largest scale ENCs and RNCs in the region: NOAA ENCs US5OR11M, and US5OR12M, and NOAA RNCs 18521 and 18523.

HCell compilation of survey H11927 used Office of Coast Survey HCell Specifications Version 3.0 and HCell Reference Guide Version 1.0.

1. Compilation Scale

Depths for HCell H11927 were compiled to the largest scale charts in the region, 18521 and 18523, 1:40,000. The density and distribution of soundings from H11927 were selected to emulate the distribution on charts 18521 and 18523. Non-bathymetric features have been generalized to chart scale.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 2-meter combined surface, **H11927_Combined**, in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 scale for the main chart area using a Radius Table file with values shown in the table, below. The resultant sounding layer contains depths ranging from 0 to 45 meters.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5

In CARIS BASE Editor soundings were manually selected from the high density sounding layers and imported into a new layer created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the river's morphology.

3. Depth Areas and Depth Contours

3.1 Depth Area

The extents of the highest resolution BASE Surface together with the extents of the soundings layer were used to digitize the hydrographic extents, which were then used to

create a single, all encompassing depth area (DEPARE). One depth range from 0 to 45 meters, was used for depth area objects. Upon conversion to NOAA charting units, the depth ranges are 0 to 147.64 feet.

3.2 Depth Contours

Some modifications made to charted shoreline MLLW contours, to bring the GC shoreline into agreement with H11927 hydrography, necessitated inclusion of several DEPCNT features in the HCell. These 0 value contours have not been generalized. See 9.2 *Conflicts between Shoreline and Hydrography*.

4. Meta Areas

The following Meta object areas are included in HCell 11927:

M_QUAL
M_COVR

Meta area objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.)

5. Features

Shoreline features for H11927 were delivered from the field in two hob files defining a features as verified and features as disproved. These were deconflicted against chart and hydrography during office processing.

There were 21 DTONs reported from survey H11927. Further information about the DTONs is provided in the DTONs report.

There were two AWOIS items investigated during survey H11927. Further information about the AWOIS items is provided in section D.1.c of the descriptive report.

The source of all features included in the H11927 HCell can be determined by the SORIND field.

6. S-57 Objects and Attributes

The H11927_CS HCell contains the following Objects:

COALNE	GC and charted MHW line
CTNARE	Points and areas depicting changeable regions
SOUNDG	Chart scale soundings
DEPARE	All-encompassing depth area and intertidal areas
DEPCNT	Zero contours
LNDARE	Islet features
LNDELV	Height feature for islets
UWTROC	Rock features
OBSTRN	Obstructions
SBDARE	Bottom samples
MORFAC	Moring facilities
PILPNT	Pilings
PONTON	Pontoons
RAILWY	Rail line
SLCONS	Shore line construction
WRECKS	Wrecked vessel
M_COVR	Data coverage Meta object
M_QUAL	Data quality Meta object
$CSYMB	Blue notes

The H11927_SS HCell contains the following Objects:

SOUNDG	Soundings at the survey scale density

All S-57 Feature Objects in the H11927_CS HCell have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with current guidance and the OCS HCell Specifications.

7. Blue Notes

Notes to the RNC and ENC chart compilers are included in the HCell as $CSYMB features with the Blue Note information located in the INFORM field. The NINFOM field is populated with the charting disposition

8. Spatial Framework

8.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

8.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

Depth Units (DUNI):	Feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, 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, and therefore have lower precision. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

Conversion to charting units and application of NOAA rounding is completed in the same step, at the end of the HCell compilation process.

Conversion to feet charting units with NOAA rounding ensures that:

- All depths display as whole feet.
- All depth units above MLLW (0 feet) display in feet.
- All height units (HUNI) which have been converted to charting units, and that are 2.0 feet above MHW and greater, are shown in feet.

9. Data Processing Notes

9.1 Junctions

H11927 junctions with survey H11757.

9.2 Conflicts between Shoreline and Hydrography

There are instances of charted shoreline in conflict with hydrography. These were examined using the highest resolution Surfaces. Conflicts were resolved making modifications to the charted shoreline.

10. QA/QC and ENC Validation Checks

H11927 was subjected to QA checks in S-57 Composer prior to exporting to the HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to a chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they have been approved by MCD as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11927 Base Cell File, Chart Units, Soundings compiled to 1:40,000
- H11927 Base Cell File, Chart Units, Soundings compiled to 1:10,000
- H11927 Base Cell File, Metric Units, Features compiled to 1:10,000
- H11927 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
- H11927 Survey Outline to populate SURDEX

11.2 File Naming Conventions

- Chart units base cell file, chart scale soundings — H11927_CS.000
- Chart units base cell file, survey scale soundings — H11927_SS.000
- Metric base cell file, survey scale features — H11927_Features.000
- Descriptive Report package — H11927_DR.pdf
- Survey outline — H11927_Outline.gml & *xsd

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.1	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.0	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.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Newport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

Peter Holmberg, Physical Scientist, PHB, Seattle, WA; 206-526-6843;
Peter.Holmberg@noaa.gov

APPROVAL SHEET
H11927

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

Digitally signed by Pete Holmberg
DN: cn=Pete Holmberg, o=NOAA, ou=PHB, email=peter.holmberg@noaa.gov, c=US
Date: 2009.06.17 13:39:59 -07'00'

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 disproval 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.

Gary C. Nelson
2009.06.17
14:06:17 -07'00'

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.

David Neander
2009.06.17
14:00:03 -07'00'

Digitally signed by Kyle R. Ward
DN: cn=Kyle R. Ward, o=NOAA, ou=HSD, email=kyle.ward@noaa.gov, c=US
Reason: AWOIS and SURF Check completed
Date: 2009.06.18 08:59:41 -04'00'