

H11939

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.

Registry No. H11939

LOCALITY

State Washington

General Locality Grays Harbor

Sublocality Approaches to Grays Harbor

2008

CHIEF OF PARTY
Captain Donald W. Haines

LIBRARY & ARCHIVES

DATE

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;">HYDROGRAPHIC TITLE SHEET</p>	<p>REGISTRY No</p> <p style="text-align: center;">H11939</p>
<p>INSTRUCTIONS – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p>	<p>FIELD No: N/A</p>
<p>State <u>Washington</u></p> <p>General Locality <u>Grays Harbor</u></p> <p>Sub-Locality <u>Approaches to Grays Harbor</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>Sep. 10 to Sep. 18, 2008</u></p> <p>Instructions dated <u>6/17/2008</u> Project No. <u>S-N922-RA-08</u></p> <p>Vessel <u>RA6 (1015), RA5 (2802),RA4 (2801), RA3 (1021) and RA1 (1101)</u></p> <hr/> <p>Chief of party <u>CAPT Donald W. Haines, NOAA</u></p> <p>Surveyed by <u>RAINIER Personnel</u></p> <p>Soundings by <u>Reson SeaBat 8101, 8125, 7125 and SSS Klein 5500</u></p> <p>SAR by <u>Keith Toepfer</u> Compilation by <u>Fernando Ortiz</u></p> <p>Soundings compiled in <u>Feet</u></p>	
<p>REMARKS: <u>All times are UTC. UTM Zone 10</u></p> <p><u>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. Page numbering may be interrupted or non sequential.</u></p> <hr/> <hr/>	

Descriptive Report to Accompany Hydrographic Survey H11939

Project S-N922-RA-08
Grays Harbor, Washington
Approaches to Grays Harbor, Washington
Scale 1:10,000
September 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 S-N922-RA-08 dated July 17, 2008 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is the approaches and entrance to Grays Harbor, Washington. This survey corresponds to sheet "A" in the sheet layout provided with the Letter Instructions.

S-N922-RA-08 responds to a request from the Washington State Department of Ecology due to the potential for grounding and a fuel oil spill. The Entrance to Grays Harbor was last surveyed in 1955 and is highly dynamic, subject to fierce winter storms and extreme ebb and flow from Grays Harbor. Grays Harbor, leading up to the east extent of this area, was surveyed in 2005 by the NRT, however they did not continue into open water. Various types of vessels, including commercial and recreational fishing vessels, tug and barges, and trans-ocean wood product ships routinely transit the area throughout the year. S-N922-RA-08 has been assigned to ensure safety of navigation in the area.

Complete multibeam echosounder (MBES) coverage was achieved in the survey area in waters 8 meters and deeper, except as noted below. In depths less than 8 meters additional MBES coverage was acquired to identify least depths over significant features or shoals, as appropriate for this survey. Total mileage acquired by each vessel and system is referenced in Table 1.

Limited shoreline verification was conducted in survey H11939.

Bottom Samples were not acquired in survey H11939.¹

200% side scan sonar (SSS) and concurrent multibeam (MBES) data were acquired in the 3 square mile area on the northern extent of the sheet. Additional side scan sonar (SSS) coverage was acquired in the entrance channel for object detection and is not intended as a deliverable. No significant objects were detected in the entrance channel.

¹ 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.

There are holidays throughout the survey which exceed the 3 adjacent node limit as per the Hydrographic Surveys Specifications and Deliverables. These holidays are discussed in detail in section B.2.

Data Acquisition Type	Hull Number with Mileage (nm)					Total
	1101	1021	2801	2802	1015	
MBES (mainscheme)	32.2	190.5	182.1	75.7	168.4	648.9
VBES + SSS (mainscheme)	-	-	-	83.8	-	83.8
Crosslines	1.3	7.3	10.1	-	17.0	35.7
Developments	-	-	1.1	-	-	1.1
Total Area Surveyed (sq. nm)	-	-	-	-	-	20.0

Table 1: Statistics for survey H11939

Data acquisition was conducted from September 10 to September 18, 2008 (DN 254 to 262).

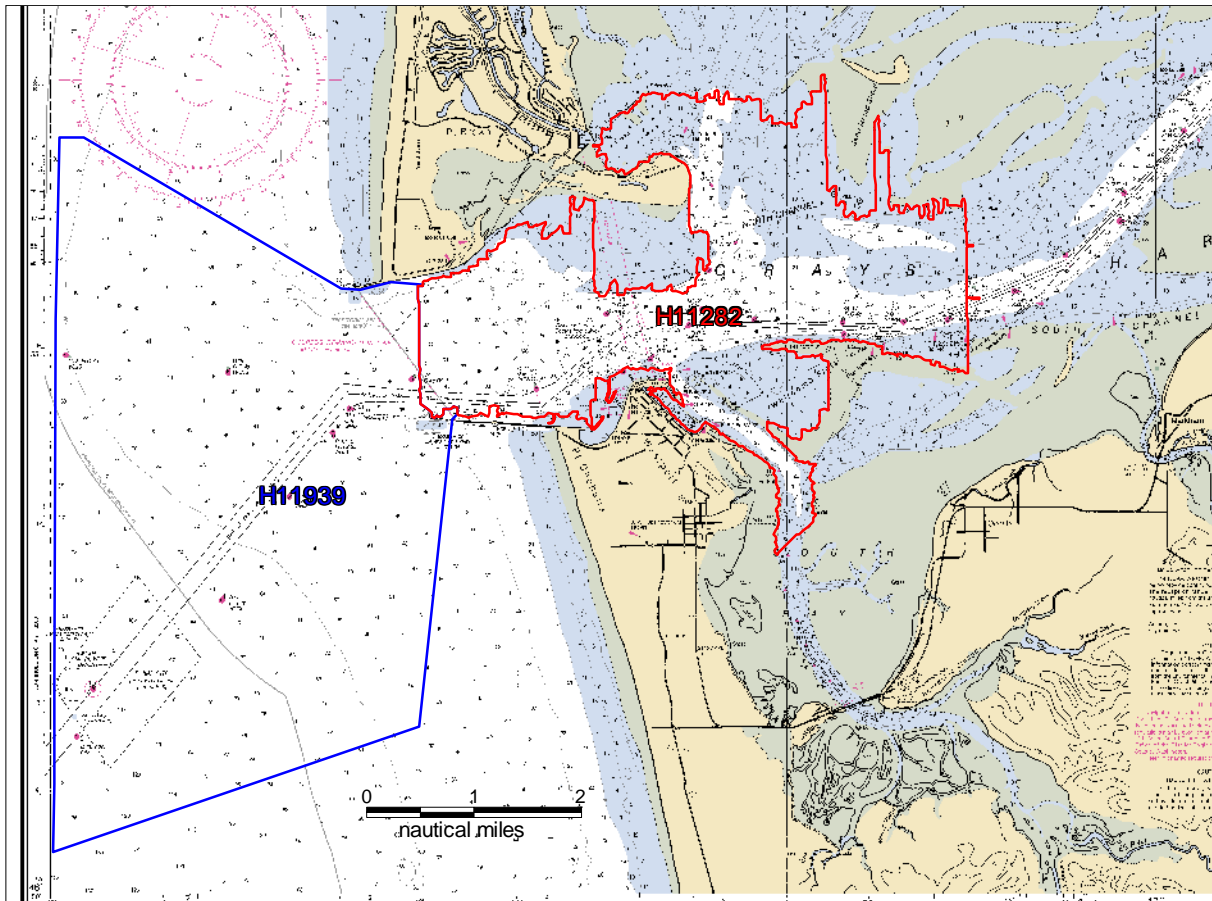


Figure 1. H11939 and H11282 Survey Limits (Chart 18502).

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 *S-N922-RA-08 Data Acquisition and Processing Report (DAPR)*², 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	Multibeam Echosounder
1021	RA-3	Multibeam Echosounder
2801	RA-4	Multibeam Echosounder
2802	RA-5	Multibeam Echosounder Side Scan Sonar
1015	RA-6	Multibeam Echosounder

Table 2. Data Acquisition Vessels for H11939.

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

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Multibeam echosounder (MBES) crosslines totaled 35.7 nautical miles, comprising 5.5% of main scheme MBES hydrography. The mainscheme bathymetry was manually compared to the XL beams in CARIS subset mode and agreed well with differences of up to 0.3 meters at nadir and 0.5 meters at outer edges, not exceeding IHO Order 1 Survey Limits³. The outer edge offsets are attributed to incorrect modeling of sound velocity.

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 submitted with this survey.

Junctions

The following contemporary survey junctions with H11939 (See Figures 1 and 2):⁴

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11282	1:10,000	2002	East

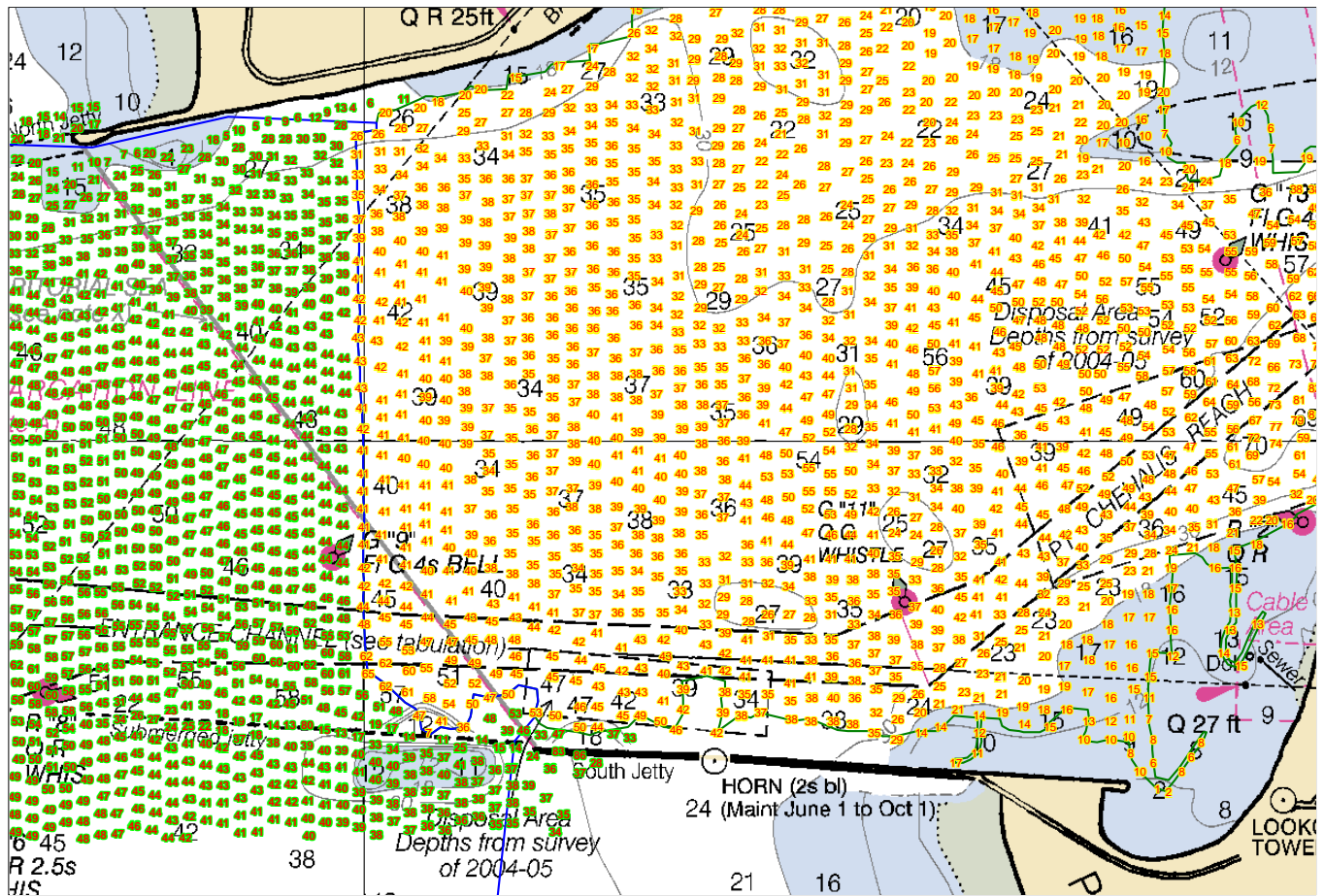


Figure 2: Junction - H11939 depths in green and H11282 in yellow

Junction comparison was completed visually in Mapinfo using the text file soundings provided by the Pacific Hydrographic Branch. H11282 was conducted using 200% side scan sonar coverage with associated single beam depths. Agreement was excellent between H11939 and H11282, as depicted in Figure 2. H11939 depths are highlighted in green on the west side and H11282 depths are highlighted in yellow on the east side. In areas of maximum deviation H11939 typically saw depths 1 to 2 feet deeper than H11282 in 35 to 45 foot depths. These differences are attributed to the dynamic nature of the bottom.⁵

Data Quality Factors

Sound Speed Artifacts

Due to river runoff and the effects of tidal currents, a sharp demarcation of water masses was often observed in the field. This proved to be problematic in the acquisition and application of sound velocity correctors. After correction for sound velocity in HDCS, some lines still exhibited the characteristic "smiles" and "frowns" indicative of inaccurate sound velocity corrections, as seen in Figure 3. Despite the best efforts of the Hydrographer to conduct sufficient sound velocity casts distributed both spatially and temporally, and to correct for sound velocity errors in post processing, sound velocity errors were still noticeable in several regions.⁶ To compensate, the Hydrographer, where possible, rejected soundings obviously in error on the outer beams. The Hydrographer feels that the only viable solutions in an area such as Grays Harbor would be continuous sound velocity profiling, or by water column "zoning." Rainier is working with the Hydrographic Systems and Technology Program to improve acquisition and processing of sound speed data.

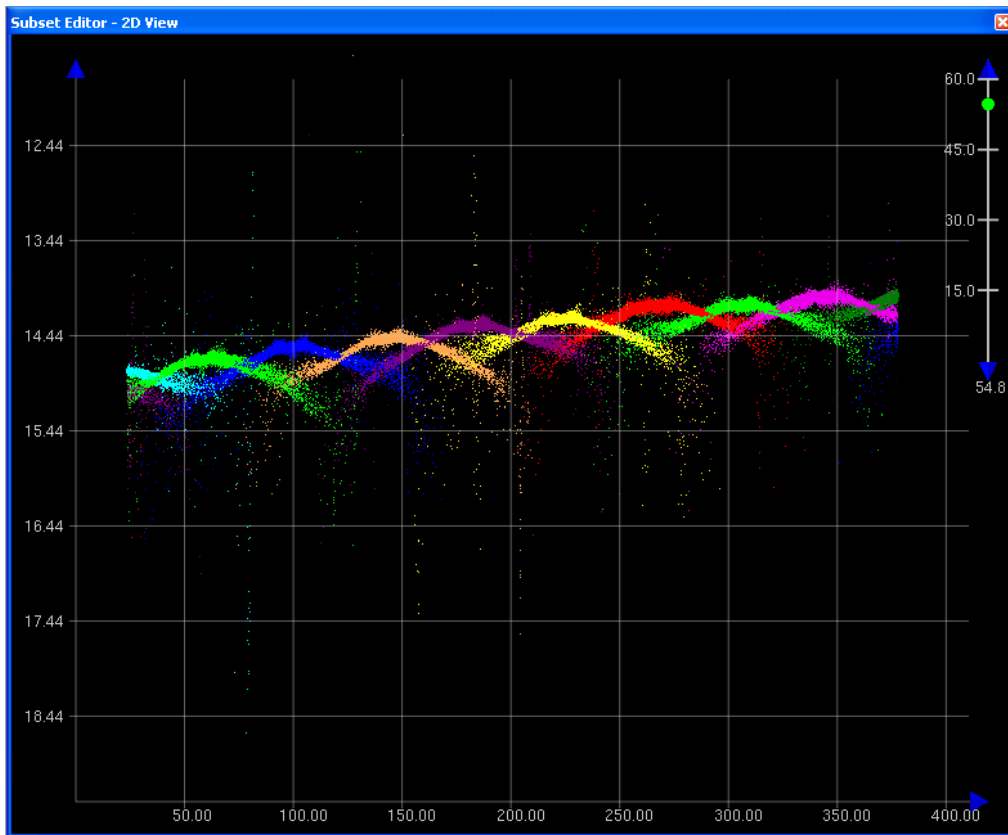


Figure 3: Typical Sound Velocity Error Found in H11939

Roll Error Caused by Unstable Swing Arm Mount

Data acquired with Launch 1021 (RA-3) on DN 261 were found to have roll offsets in the data. The lines were viewed in CARIS calibration editor and a separate roll error value was calculated for the HVF for those days. The data were reprocessed using the new values and were found to be much improved and within specifications.⁷ Figure 4 depicts the data before HVF correction and Figure 5 depicts the data after the adjustment. Original HVF values from 2008 patch tests were used for the remaining data acquired with Launch 1021. The variability of roll offsets seen on different days of acquisition can be attributed to the retractable mount of the Reson 8101. The sonar head is mounted on an extendable arm that is retracted and extended for use on each survey day. Launch 1021 (RA-3) has been replaced with Launch 2803, which is equipped with a Reson 7125 sonar. This change will eliminate the possibility of a swing arm adversely affecting the data.

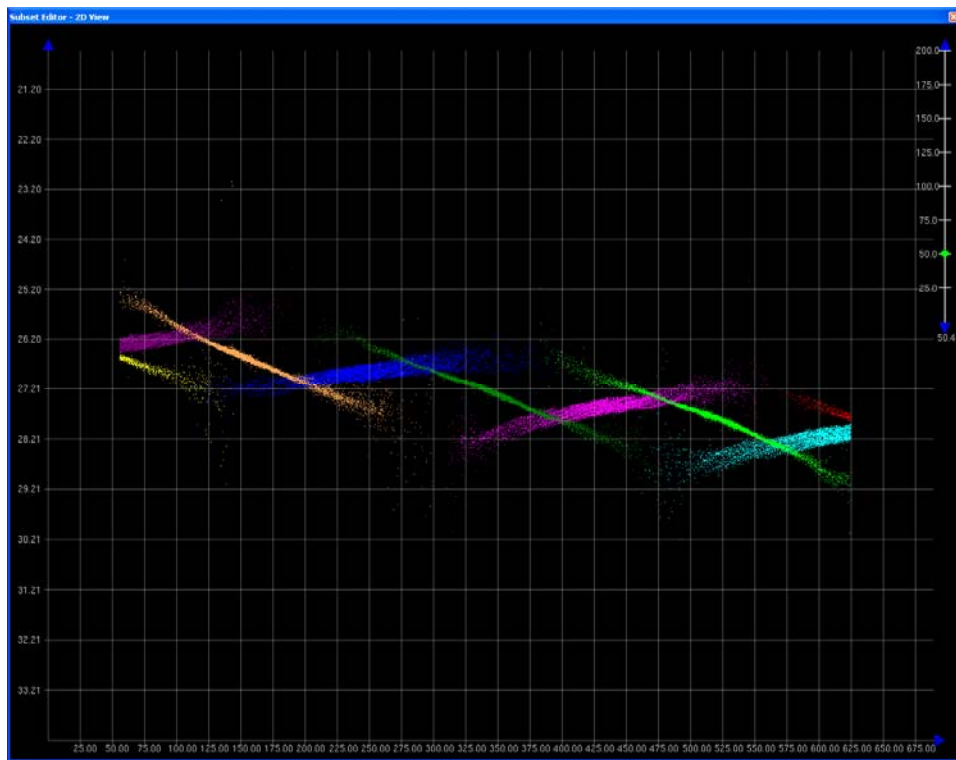


Figure 4: Roll error before adjustment, DN 261 Vessel 1021

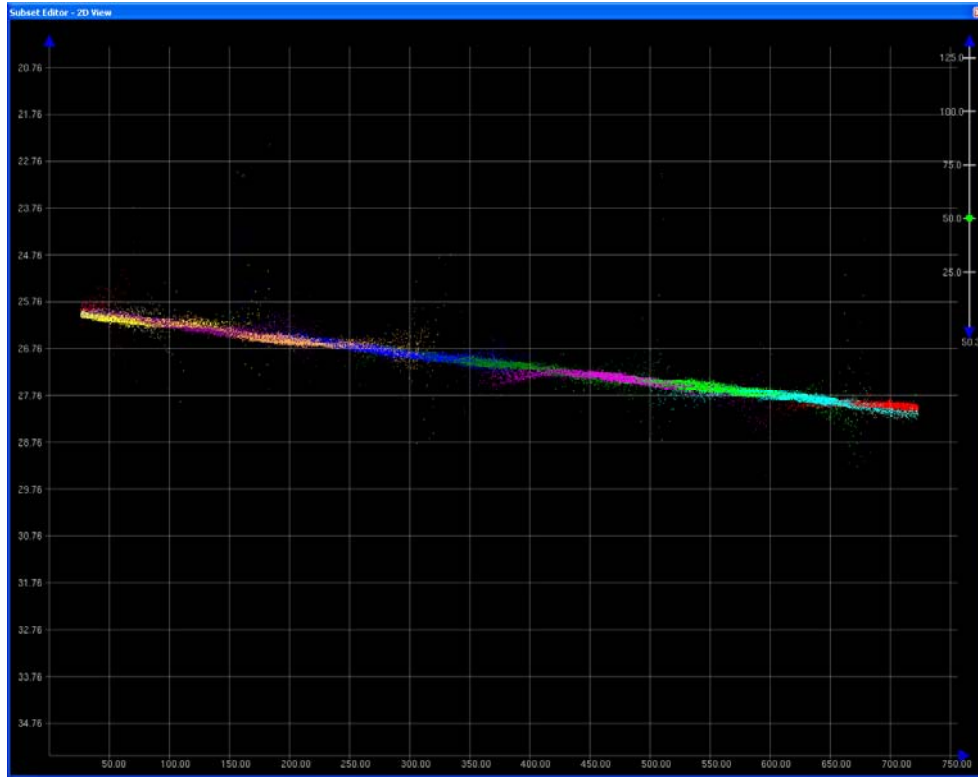


Figure 5: Roll error after adjustment, DN261 Vessel 1021

Holidays

As noted in section A, holidays appear in the final BASE surface exceeding the 3 adjacent node standard of the Hydrographic Surveys Specifications and Deliverables. Offshore, these holidays were attributed to excessive movement of multibeam sensors due to high sea state at the time of acquisition. Inshore, areas such as the submerged jetties were subject to extremely hazardous breakers that precluded full coverage from being attained.

Holidays were also attributed to data with poor sound speed correctors pulling the BASE surface out of specification. Rejected soundings led to sparse coverage on the outer beams. All rejected data were examined for objects and none were observed.

One of the larger holidays occurs on the BASE surface approximately 1.5 NM south of the submerged jetty, as depicted in Figure 6. As seen in the 3D Subset Detail in Figures 7 and 8, the holiday is caused by rejection of erroneous data blowouts. Existing data meet the standard of feature detection and should supersede charted depths.⁸

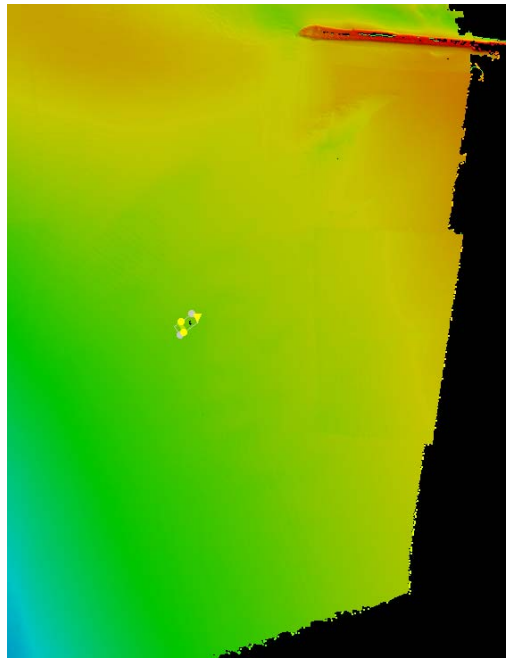
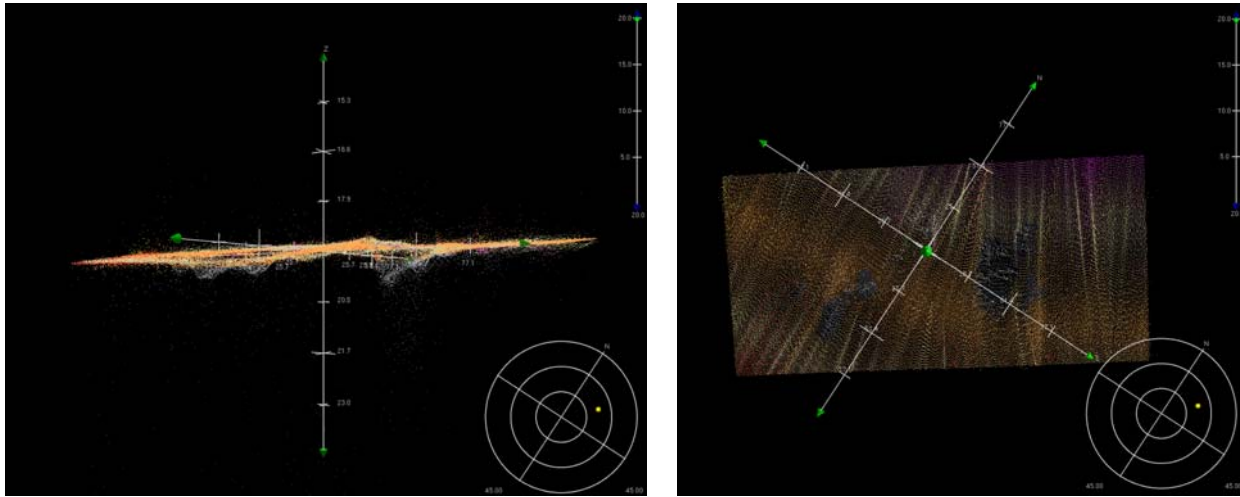


Figure 6: Area of Significant Holiday



Figures 7 and 8: Significant Holiday Detail shown with rejected soundings

B3. Data Reduction

Data reduction procedures for survey H11939 conform to those detailed in the *S-N922-RA-08 DAPR*.

B4. Data Representation

Many BASE surfaces were used in processing H11939. Final BASE surface resolutions and depth ranges were set in accordance with *Rainier's* standard in Table 3. These BASE surfaces were contained in five field sheets with a maximum number less than 26.6x10⁶ nodes. One line of bathymetry (255-1645-1) had no associated ship navigation and was ignored in BASE surface creation with no impact on data quality. The submission Field Sheet and BASE Surface structure is shown in Figure 9. The layout of field sheets is shown in Figure 10.

Depth Range (m)	Resolution (m)	CUBE Parameter Disambiguation Method Advanced Option
0-21.5	1	Shallow
18.5-52	2	Deep

Table 3. Depth range and surface resolutions for H11939

Side Scan Sonar data were split into two complete coverage mosaics to demonstrate areas covered by this technique (in addition to the required 100% SWMB). These mosaics were created at 2m resolution and named “H11939_SSS100” and “H11939_SSS200”. Additional SSS data were acquired in the entrance channel for object detection and not intended as a deliverable.

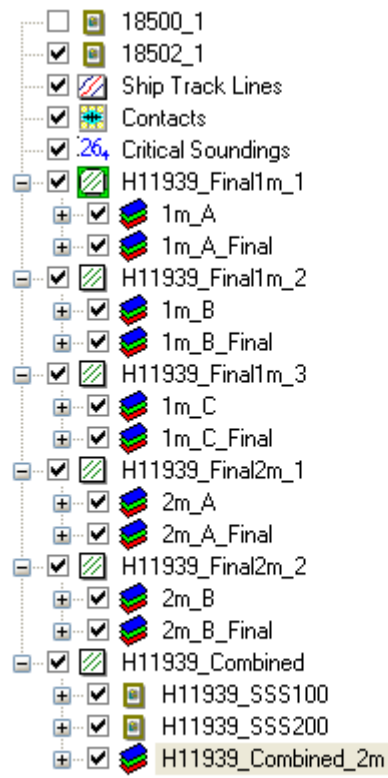


Figure 9: Field sheets and BASE surfaces submitted with H11939.

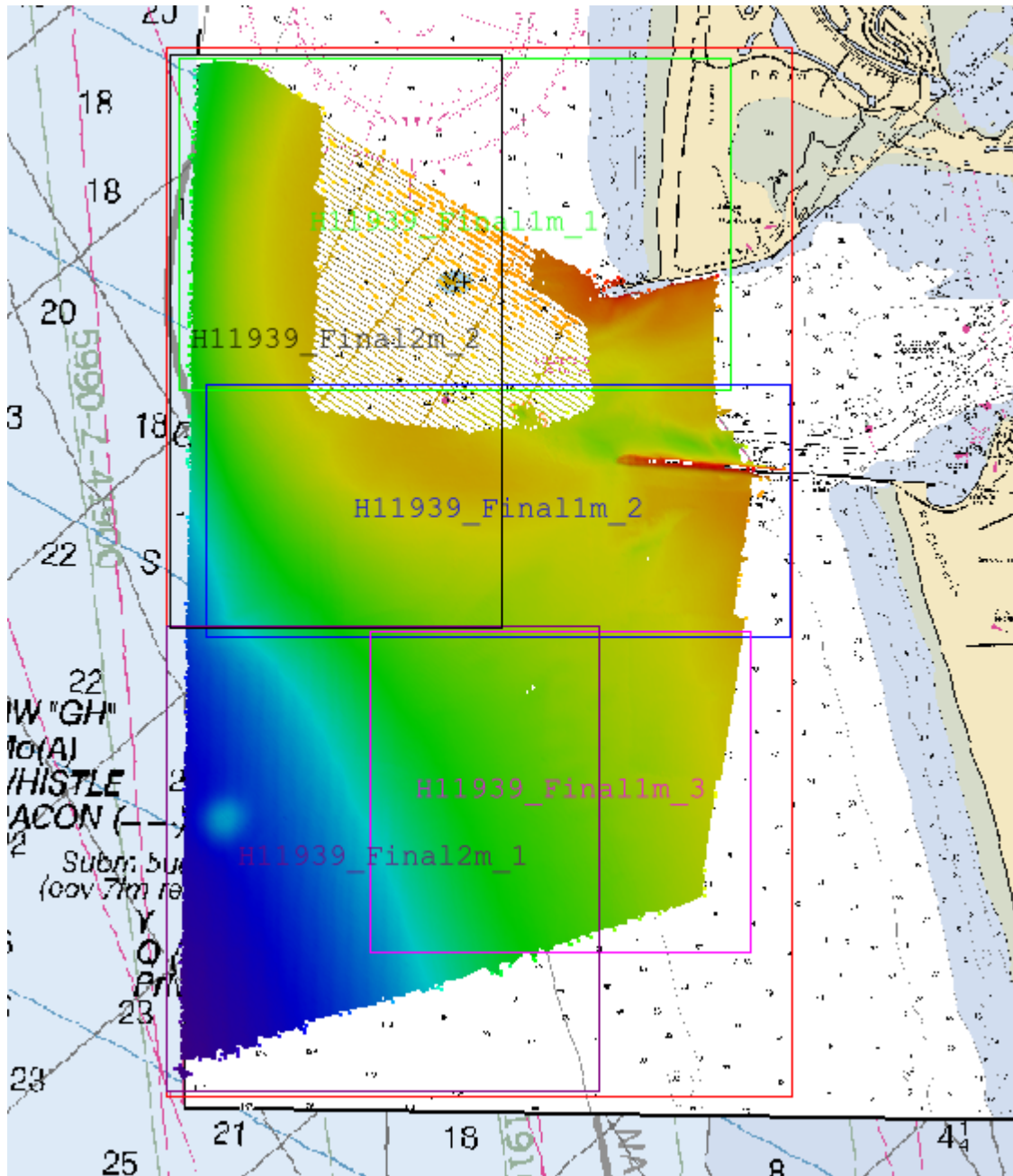


Figure 10: Layout of field sheet and BASE surfaces for H11939, overlaid on NOAA Charts 18502 and 18500.

C. VERTICAL AND HORIZONTAL CONTROL

Project S-N922-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	287 kHz	USCG	50nm	Primary
Robinson Point	323 kHz	USCG	90nm	Secondary

Table 4: Differential Corrector Sources for H11939.

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 Westport, WA (944-1102) served as control for datum determination and is the primary source for water level reducers for survey H11939.

No tertiary gauges were required. All data were reduced to MLLW using final approved water levels from Westport, WA (944-1102) using the tide file 9441102.tid and final time and height correctors using the zone corrector file N922RA2008CORP.zdf.

The request for Final Approved Water Levels for H11939 was submitted to CO-OPS on 09/21/2008 and the Final Tide Note was received on 10/14/2008⁹. This documentation is included in Appendix IV.

RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11939 was compared with the following charts:

Chart	Scale	Edition and Date	Local Notice to Mariners Applied Through
18502	1:40,000	86 th Ed, May 2007	06/11/2008
18500	1: 180,789	30 th Ed; May 2008	05/01/2008

Table 4: Charts compared with H11939

Charted depths agree well with survey soundings. Discrepancies of up to 3 feet were seen in the dynamic entrance channel area where charted depths were shoaler than survey soundings. The following exceptions were found:

1. The area in the Southwest corner of the sheet entitled “Disposal Area” was confirmed with depths 5 feet deeper than charted from 2002 Survey. The Hydrographer recommends retaining the “Disposal Area” notation on chart and updating soundings as per digital data.¹⁰
2. Depths around AWOIS item 53117 ¹¹(Southern “Submerged Jetty”) are significantly deeper than charted. Further discussion can be found in the AWOIS Investigations section D.1.c.
3. The North Jetty has shoal areas adjacent to the shore that extend further from shore than charted, as depicted in Figure 11. The Hydrographer recommends extending the contour line with blue tint in this area.¹²

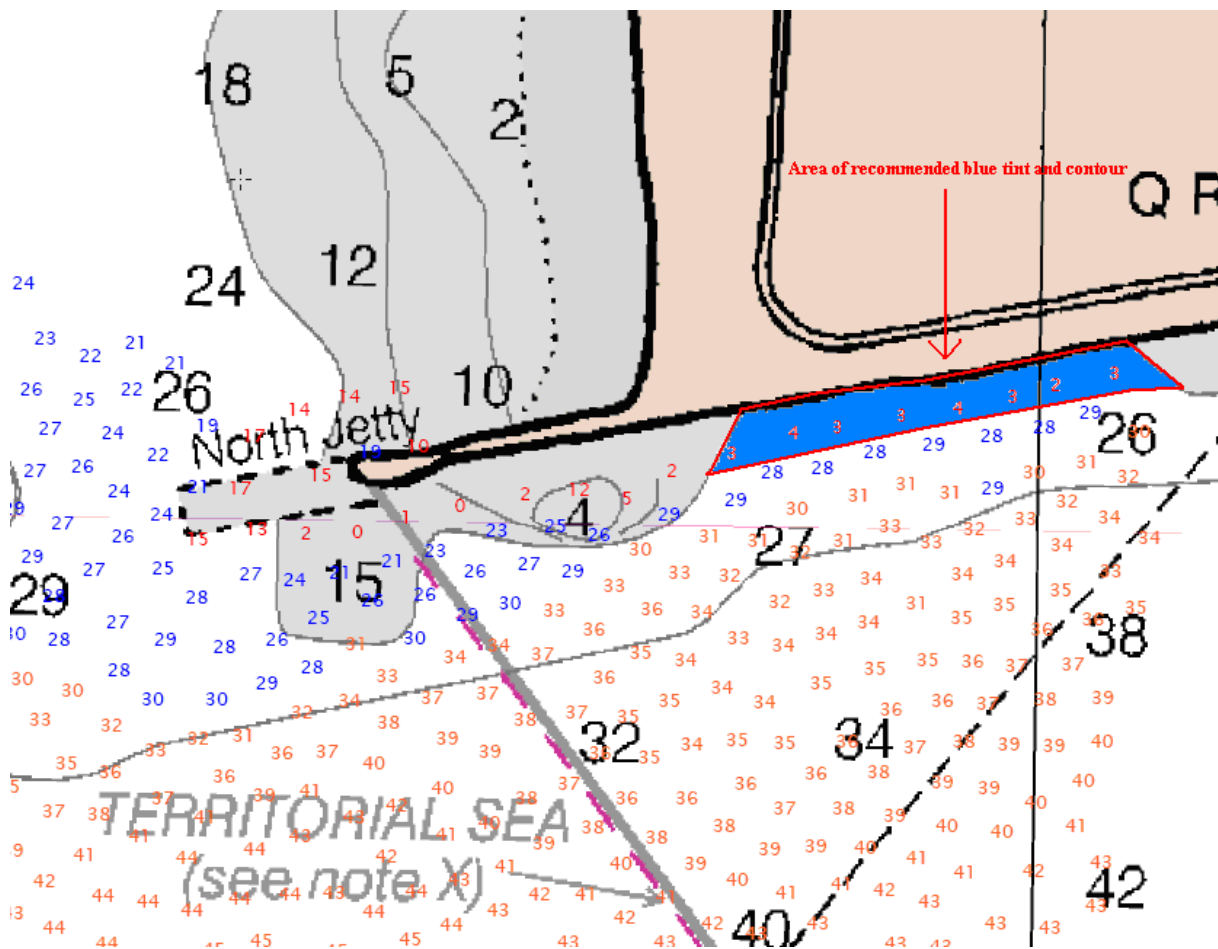


Figure 11: Survey Soundings overlaid on Chart 18502 in North Jetty Area

4. Several 45' soundings were noted in the middle half and left outside quarter of the bar channel, as depicted in Figure 12. These soundings are shoaler than tabulated depths, which are 46.7' for the outside quarter and 46.4' for the middle half of channel. On 3/27/2009 the Northwest Region Navigation Manager was notified of the shoaler depths. This information was passed on to the US Army Corps of Engineers, who started a dredging project on 4/2/2009, the extents of which cover the above mentioned shoal area. A copy of the correspondence is included in Appendix V, Supplemental Correspondence. The Hydrographer recommends updating the tabulated depths from the U.S. Army Corps of Engineers post dredge survey, expected after completion of the dredging assignment.¹³

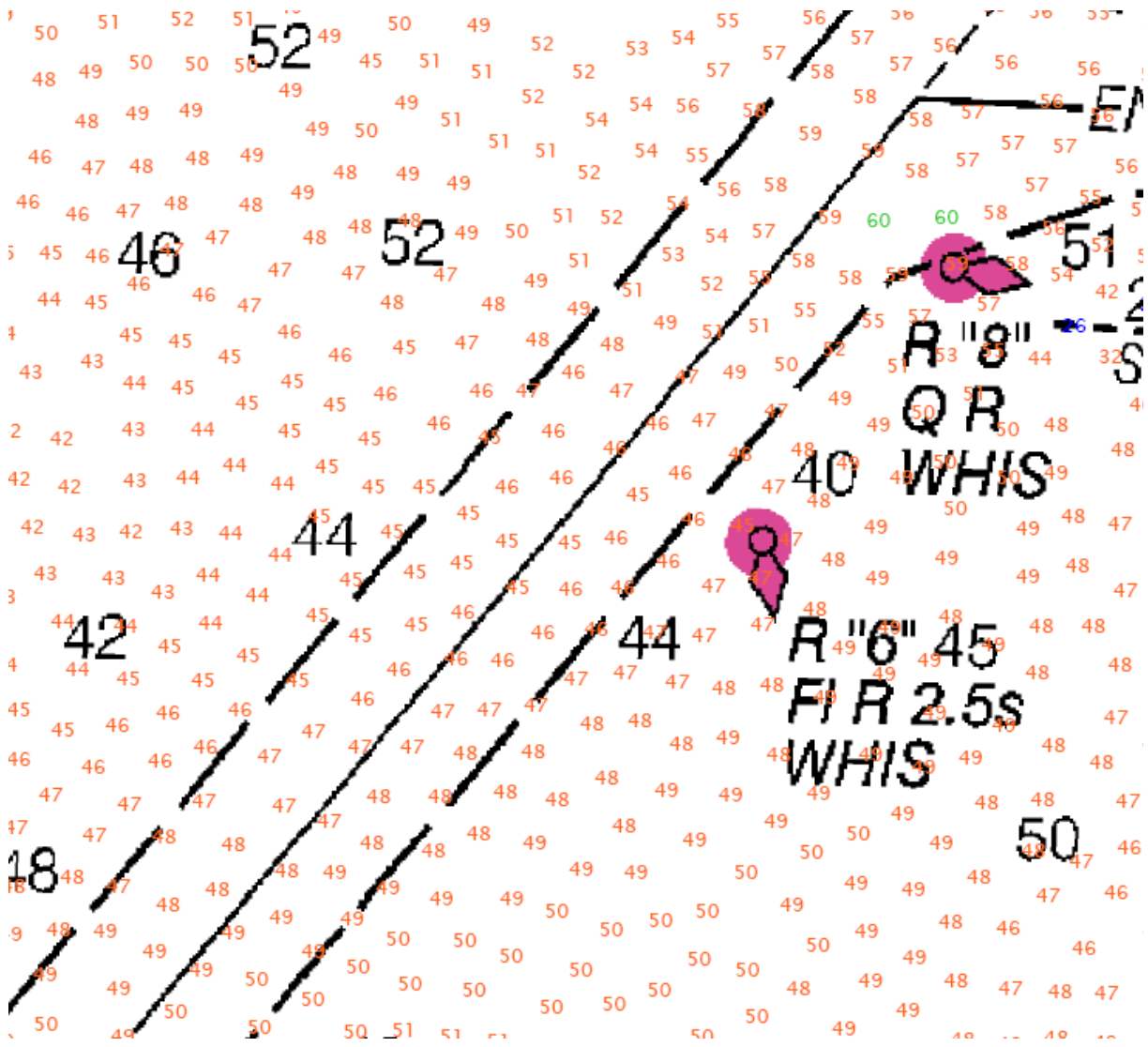


Figure 12: 45' Soundings in Bar Entrance Channel of Chart 18502

Except as noted above, the Hydrographer recommends that survey soundings supersede all prior survey and charted depths in the common area.¹⁴

D.1.b. Dangers to Navigation

Two (2) Dangers to Navigation (DTONs) were found on survey H11939, and reported to the Marine Chart Division via email on 09/19/2008. The original DTON submission package is included in Appendix I.¹⁵

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

Two (2) AWOIS items fall within the survey limits of H11939. Both of these were assigned for full investigation.

AWOIS item 50581 (Submerged Buoy in Entrance Channel) was investigated with object detection multibeam coverage and disproven. The Hydrographer recommends removing the item from the chart.^{16, 17}

AWOIS item 53117 (South Jetty)¹⁸ is a prominent feature in the survey and was detected by multibeam bathymetry. Object detection MBES was not acquired over the entirety of item 53117 due to swell and dangerous operating conditions. It is charted in the correct location, however soundings from H11939 in the vicinity of the jetty are deeper than charted. The Hydrographer recommends retaining the Jetty on the chart and charting as per the digital data, taking out blue tint on the adjacent "Disposal Area" and updating contours.¹⁹

As a result of the nature of these obstructions as part of multibeam bathymetry, individual reports of each AWOIS item investigation were not warranted.

Additional Items

No additional charted items were investigated and no other features were located on survey H11939.

D.2. Additional Results

D.2.a. Prior Survey Comparison

Prior survey comparison was not performed. Hydrographer recommends current survey supersedes previous soundings and data.²⁰

D.2.b. Shoreline Verification

Limited shoreline verification was performed for survey H11939. All prominent shoreline items adjacent to survey extents were visually verified and found to be accurately depicted on the digital raster chart.²¹

D.2.c. Aids to Navigation

Survey H11939 included nine aids to navigation (ATONs). Each ATON's position was visually checked in the field against the digital raster chart. Each of the ATONs was found to serve its intended purpose, except as noted below. Although the bar entrance range was not part of the assigned sheet limits, the range was visually checked and found to be accurately depicted the digital raster chart.

Discrepancies between the charted and surveyed positions were found for the following ATON. The Green "3" Buoy denoting the entrance to the harbor is noted in the incorrect position on chart 18500. Chart 18502 has the accurate position, approximately 1.1 NM north of the charted 18500 G "3" Buoy (see Figure 13). The discrepancy has been reported and corrected in the District 13 Local Notice to Mariners, week 39/08.²²

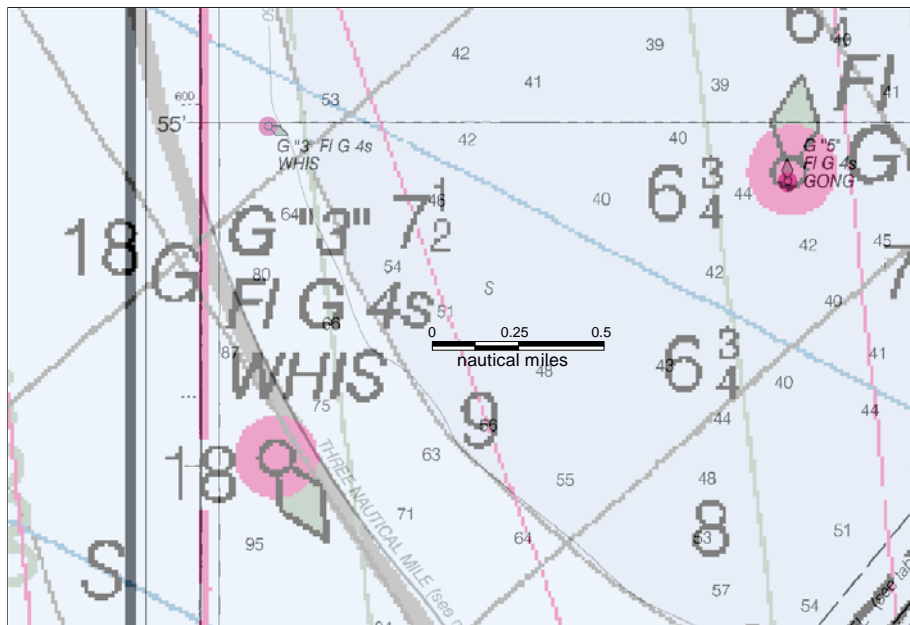


Figure 13: Buoy G "3" on Chart 18502 and overlaid 18500

D.2.d. Overhead Features

There are no overhead features within the limits of survey H11939.²³

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H11939, and none were detected by the survey.²⁴

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11939, and none were observed to be operating in the area.²⁵

D.2.g. Bottom Samples

Bottom samples were not performed in survey H11939.²⁶

D.2.h. Other Findings

No additional findings were noted in survey H11939.

E. APPROVAL

As Chief of Party, Field operations for hydrographic survey H11939 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 and no additional work is required. 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:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-N922-RA-08	4/6/2009	N/CS34
Coast Pilot Report for S-N922-RA-08	TBD	N/CS26

Approved and Forwarded:



Donald W. Haines, CAPT/NOAA
I am approving this document
2009.04.09 10:23:35 -07'00'

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:



Matthew Nardi
I am the author of this document
2009.04.08 20:49:00 -07'00'

Ensign Matthew Nardi, NOAA
Junior Officer

Chief Survey Technician:



James B Jacobson
I have reviewed this document
2009.04.08 11:29:33 -07'00'

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

Field Operations Officer:



I have reviewed this document
2009.04.08 11:34:52 -07'00'

Lieutenant Charles Yoos, NOAA
Field Operations Officer

Revisions and Corrections Compiled During Office Processing and Certification

¹ See Endnote 23.

² Filed with project records.

³ Concur.

⁴ H11282 was applied to the chart in 2006.

⁵ Concur.

⁶ The data is adequate to supersede charted data despite the sound velocity issue.

⁷ Concur.

⁸ Concur.

⁹ Tide note is appended to this report.

¹⁰ Concur.

¹¹ Misabeled AWOIS item. See Endnote No.14.

¹² Concur.

¹³ Concur. Records of correspondence are appended to this report.

¹⁴ Concur.

¹⁵ All reported DTONs have been applied to the chart and are included in the HCell. See attached DTON reports.

¹⁶ Do not concur. AWOIS item 50581 refers to a submerged portion of the North jetty. Retain North jetty as charted.

¹⁷ Concur with disapproval of submerged buoy, AWOIS item 53117

¹⁸ Concur with clarification. Information pertaining to south jetty and the adjacent disposal area is correct though it is not associated with AWOIS item 53117.

¹⁹ Concur with the hydrographers recommendations.

²⁰ Concur.

²¹ Concur with Clarification. The submitted HOB files were used in the compilation of HCell H11939. During compilation some modifications were made to accommodate chart scale. Chart features as depicted in the HCell.

²² Use latest ATONIS information.

²³ Concur.

²⁴ Concur.

²⁵ Concur.

²⁶ No bottom samples were collected during this survey. Bottom samples were imported into the HCell from the ENC to be retained (US5WA60M).

Danger to Navigation Report 1

Registry Number: H11939
State: Washington
Locality: Approaches to Grays Harbor
Sub-locality: Approaches to Grays Harbor
Project Number: S-N922-RA-08
Survey Date: 09/18/2008

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
18502	86th	05/01/2007	1:40,000 (18502_1)	USCG LNM: 06/03/2008 (06/03/2008) CHS NTM: None (05/30/2008) NGA NTM: None (06/07/2008)
18500	30th	05/01/2008	1:180,789 (18500_1)	[L]NTM: ?
18003	20th	11/01/2006	1:736,560 (18003_1)	[L]NTM: ?
18007	32nd	07/01/2005	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	13.51 m	46° 54' 45.2" N	124° 11' 46.0" W	---
1.2	Wreck	7.40 m	46° 55' 38.0" N	124° 12' 29.9" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 683/359 from h11939 / 2801_reson7125_hf_512_hysweep / 2008-262 / 007_2250

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 54' 45.2" N, 124° 11' 46.0" W
Least Depth: 13.51 m (= 44.34 ft = 7.390 fm = 7 fm 2.34 ft)
TPU (±1.96σ): **THU (TPEh)** ±1.966 m ; **TVU (TPEv)** ±0.341 m
Timestamp: 2008-262.22:51:02.608 (09/18/2008)
Survey Line: h11939 / 2801_reson7125_hf_512_hysweep / 2008-262 / 007_2250
Profile/Beam: 683/359
Charts Affected: 18502_1, 18500_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Designated sounding is on the shallowest of 4 obstructions on the seafloor. Obstructions are cubes measuring approximately 4m per side.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11939/2801_reson7125_hf_512_hysweep/2008-262/007_2250	683/359	0.00	000.0	Primary

Hydrographer Recommendations

Chart as 44 ft Obstructions.

Cartographically-Rounded Depth (Affected Charts):

44ft (18502_1)
 7 ¼fm (18500_1, 18003_1, 18007_1, 530_1)
 13.5m (501_1, 50_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: CONDTN - 2:ruined
 QUASOU - 1:depth known

RECDAT - 20080917

SORDAT - 20080917

SORIND - US,US,survey,H11939

TECSOU - 3:found by multi-beam

VALSOU - 13.514 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

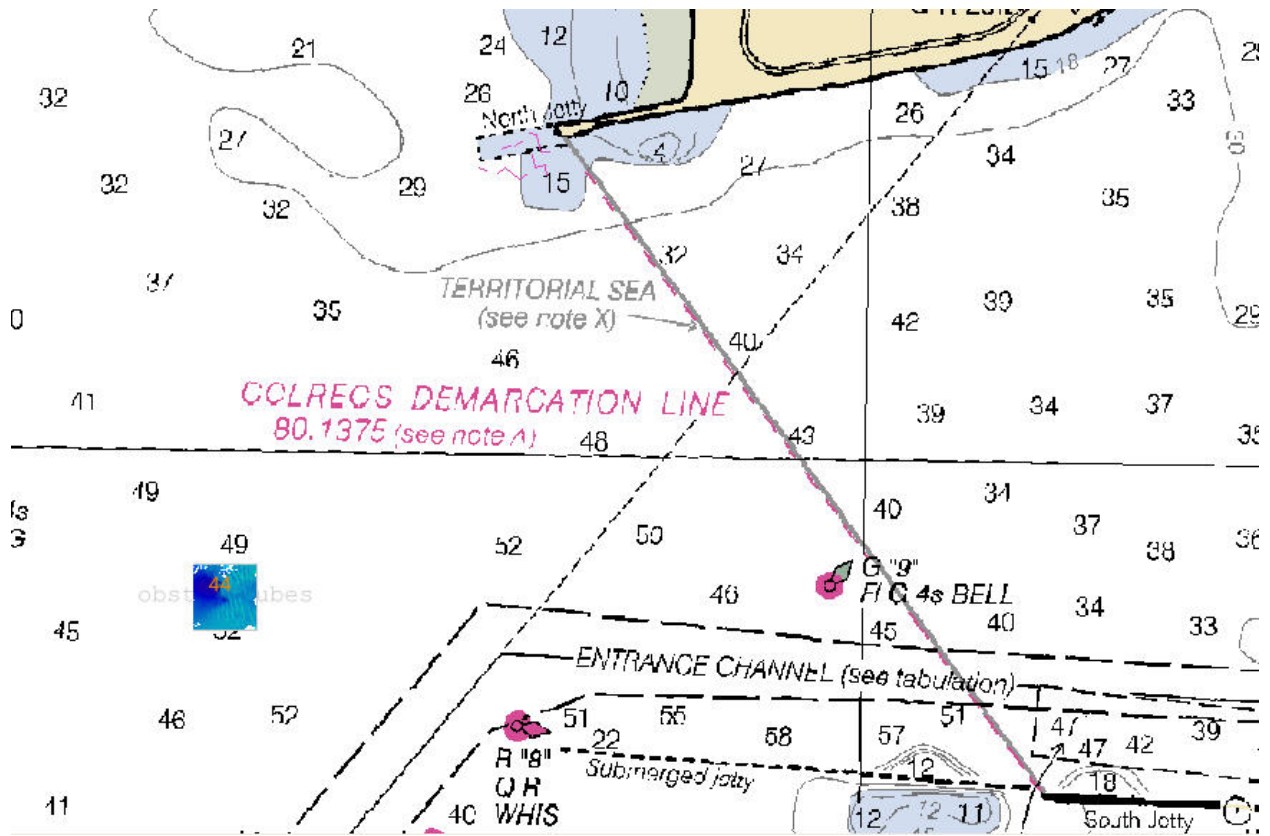


Figure 1.1.1

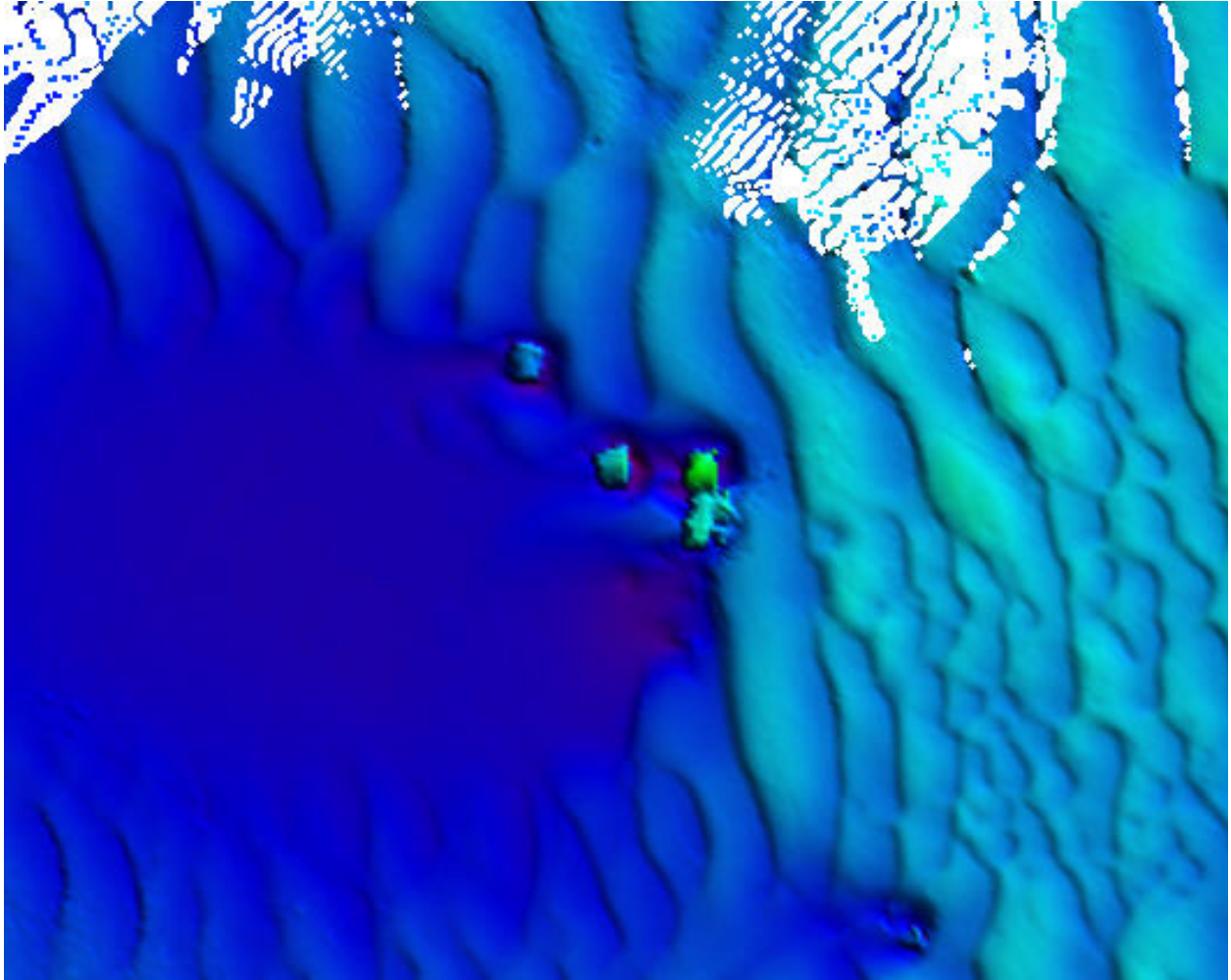


Figure 1.1.2

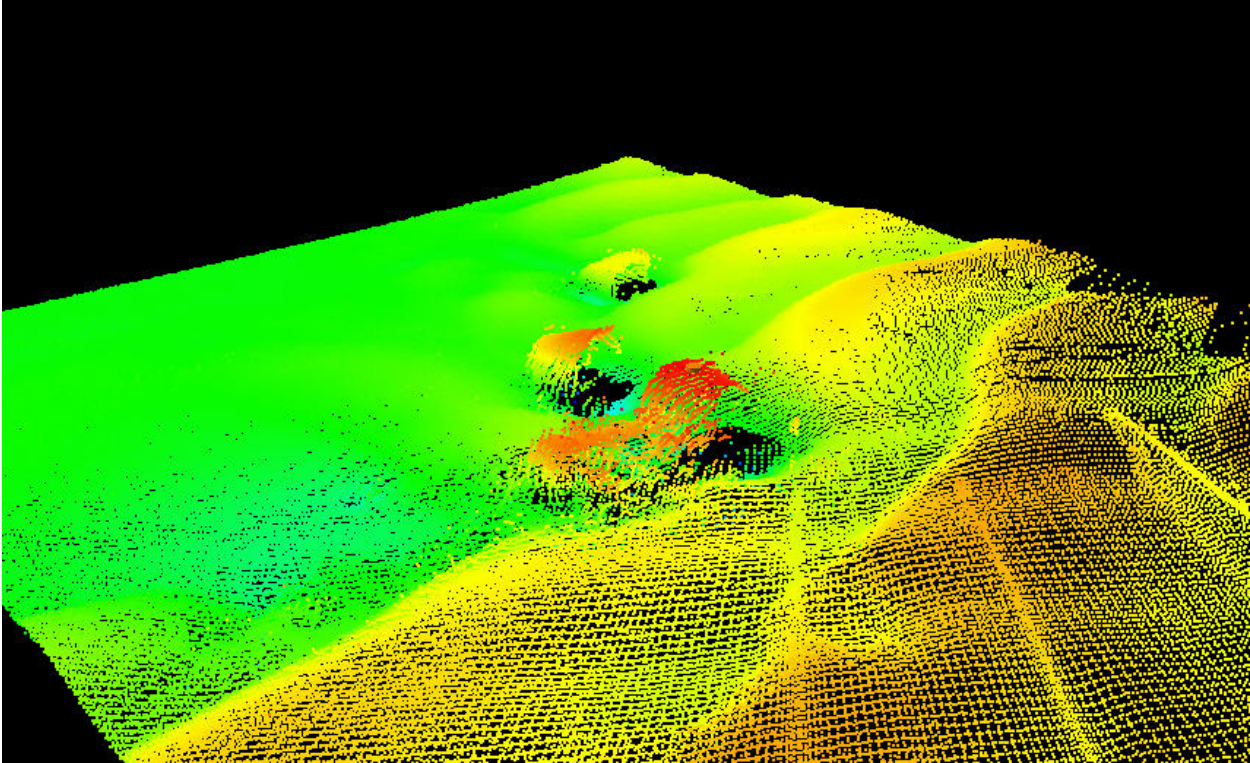


Figure 1.1.3

1.2) Profile/Beam - 489/146 from h11939 / 2801_reson7125_hf_512_hysweep / 2008-262 / 800_2055

DANGER TO NAVIGATION

Survey Summary

Survey Position: 46° 55' 38.0" N, 124° 12' 29.9" W
Least Depth: 7.40 m (= 24.28 ft = 4.046 fm = 4 fm 0.28 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.969 m ; **TVU (TPEv)** ± 0.314 m
Timestamp: 2008-262.20:56:22.618 (09/18/2008)
Survey Line: h11939 / 2801_reson7125_hf_512_hysweep / 2008-262 / 800_2055
Profile/Beam: 489/146
Charts Affected: 18502_1, 18500_1, 18003_1, 18007_1, 501_1, 530_1, 50_1

Remarks:

Shipwreck found with Side Scan Sonar and developed with multibeam. Wreck is lying in a predominantly east-west orientation with the bow to the east. The least depth of 7.4 m is at the bow and rises approximately 5 m from the surrounding seafloor. This contact is positioned at the least depth, not the center of the wreck.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11939/2801_reson7125_hf_512_hysweep/2008-262/800_2055	489/146	0.00	000.0	Primary
h11939/2802_klein5k_100_hvf/2008-260/sonar_data080916101700	0003	9.01	072.5	Secondary
h11939/2802_klein5k_100_hvf/2008-260/sonar_data080916101700	0001	51.62	104.1	Secondary (grouped)
h11939/2802_klein5k_100_hvf/2008-260/sonar_data080916101700	0002	88.67	100.2	Secondary (grouped)

Hydrographer Recommendations

Chart as 24 ft Wreck.

Cartographically-Rounded Depth (Affected Charts):

- 24ft (18502_1)
- 4fm (18500_1, 18003_1, 18007_1, 530_1)
- 7.4m (501_1, 50_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
HEIGHT - 5 m
RECDAT - 20080917
SORDAT - 20080918
SORIND - US,US,survey,H11939
STATUS - 1:permanent
TECSOU - 3:found by multi-beam
VALSOU - 7.400 m
VERDAT - 12:Mean lower low water
WATLEV - 3:always under water/submerged

Feature Images

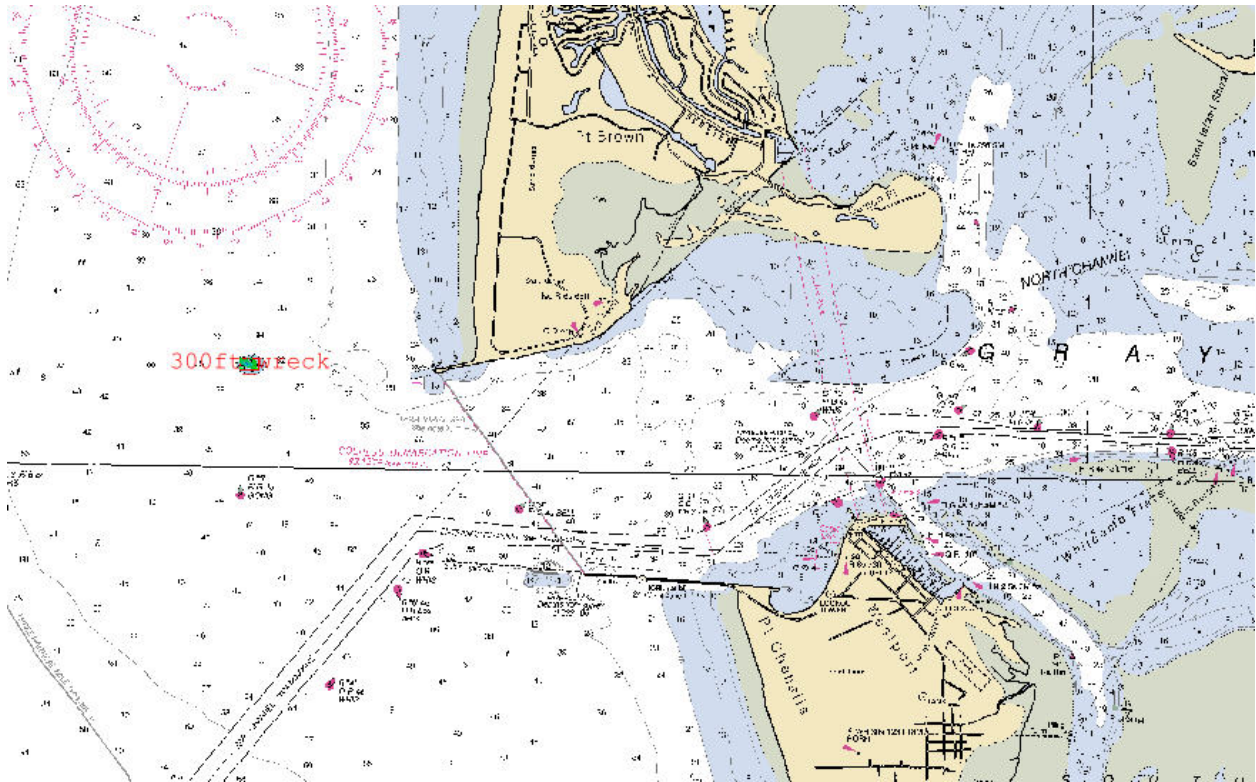


Figure 1.2.1

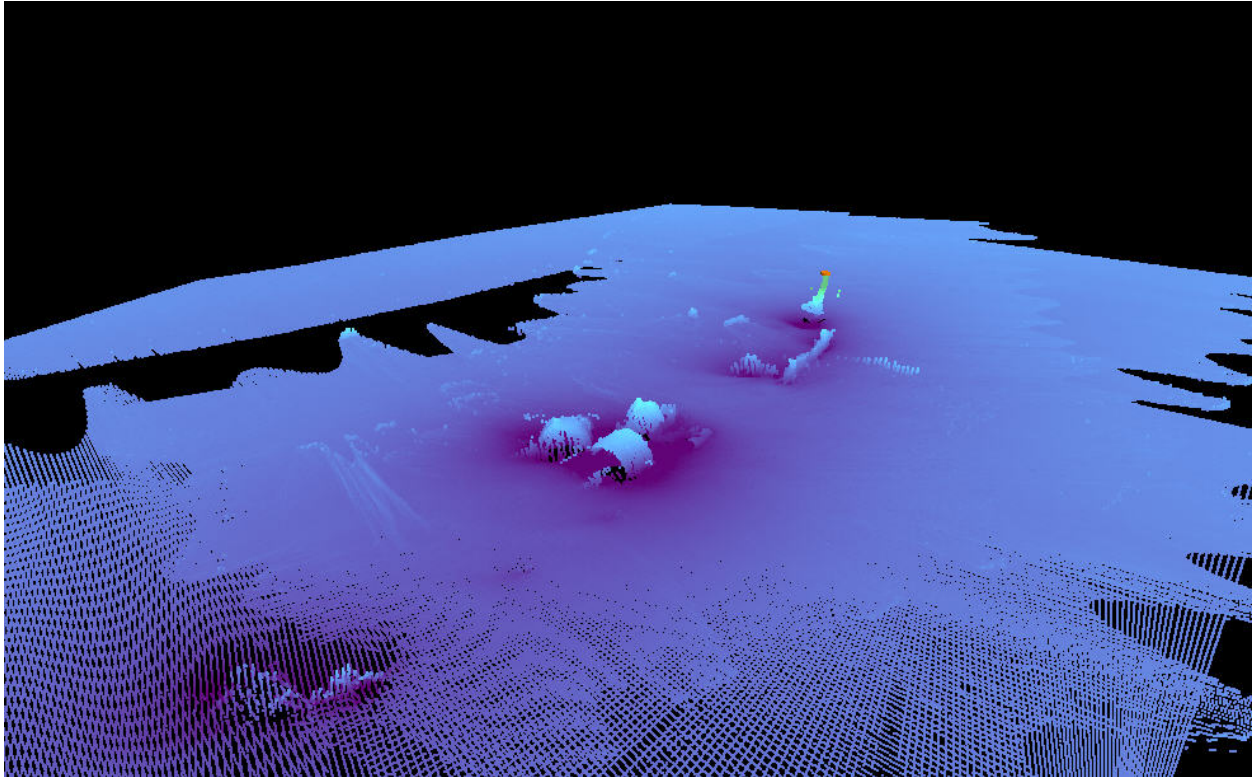


Figure 1.2.2

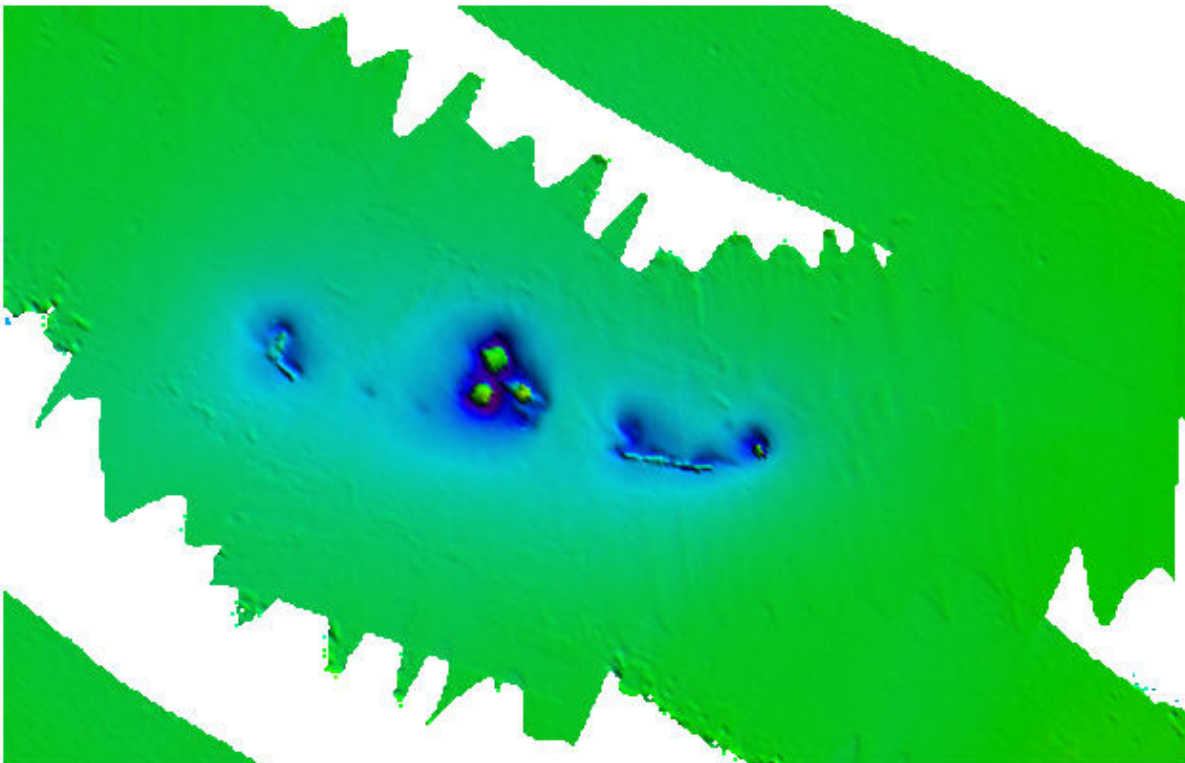


Figure 1.2.3

Subject: [Fwd: H11939 Entrance Channel Shoaling]

From: David Neander <Dave.Neander@noaa.gov>

Date: Wed, 01 Apr 2009 10:50:30 -0700

To: hiram.t.arden@usace.army.mil

CC: thomas.j.szelest@usace.army.mil, CO.Rainier@noaa.gov, Matthew.Nardi@noaa.gov, FOO Rainier <FOO.Rainier@noaa.gov>

Mr. Arden,

Please see email note below and attached images from the September 2008 /Rainier/ survey of the Approaches to Grays Harbor. /Rainier/ noted an area of depths shoaler than the tabulated depth in the vicinity of buoy "6". The decimated soundings in the attached graphics are a result of a full-bottom coverage survey using a Reson 7125 multibeam.

If you have any questions or would like any additional supporting information, please don't hesitate to contact myself or ENS Nardi from /Rainier/.

Thanks,
Dave

----- Original Message -----

Subject: H11939 Entrance Channel Shoaling
Date: Fri, 27 Mar 2009 17:34:26 +0000 (GMT)
From: matthew nardi <Matthew.Nardi@noaa.gov>
To: Dave.Neander@noaa.gov
CC: CO.Rainier@noaa.gov, FOO.Rainier@noaa.gov

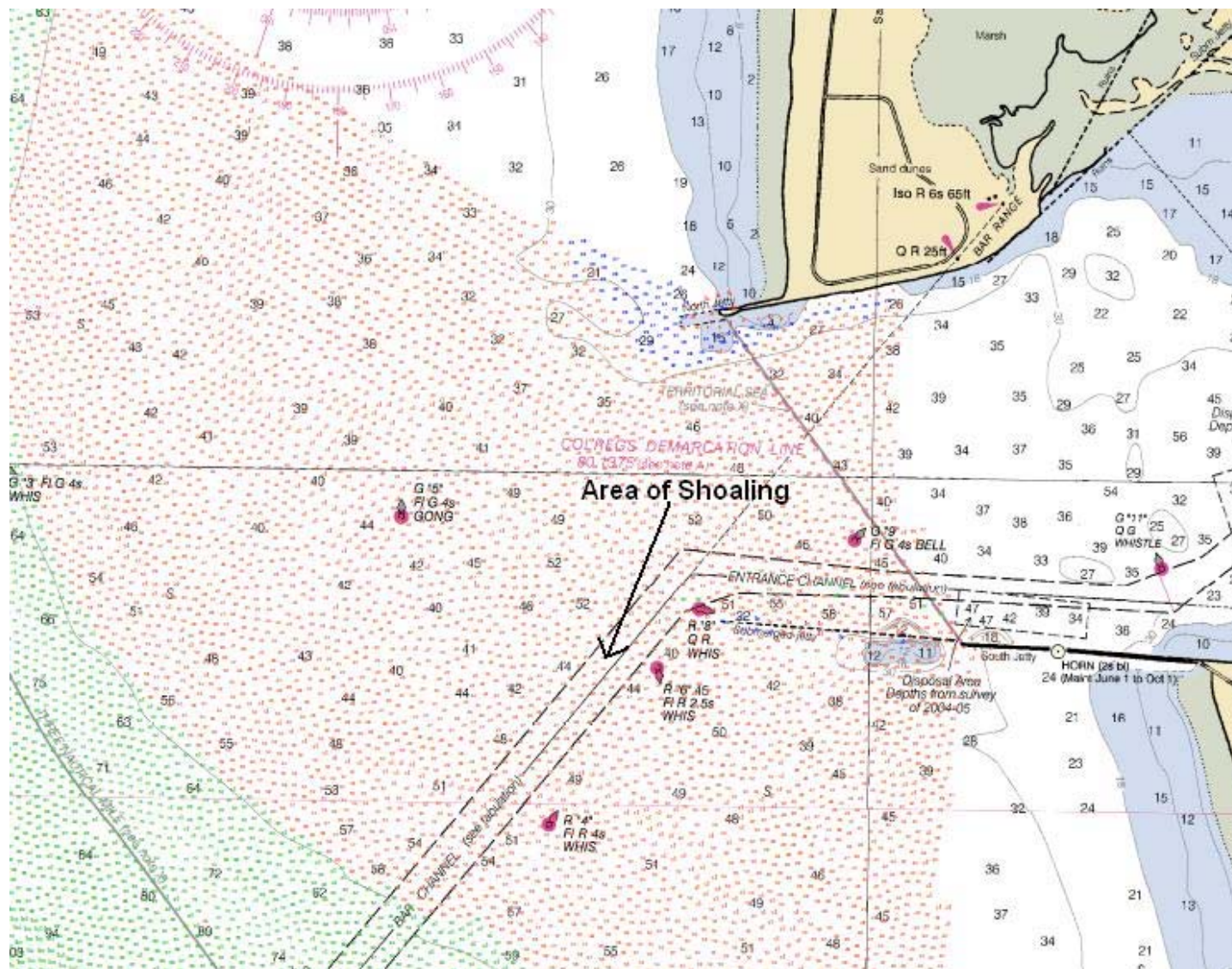
CAPT Neander,

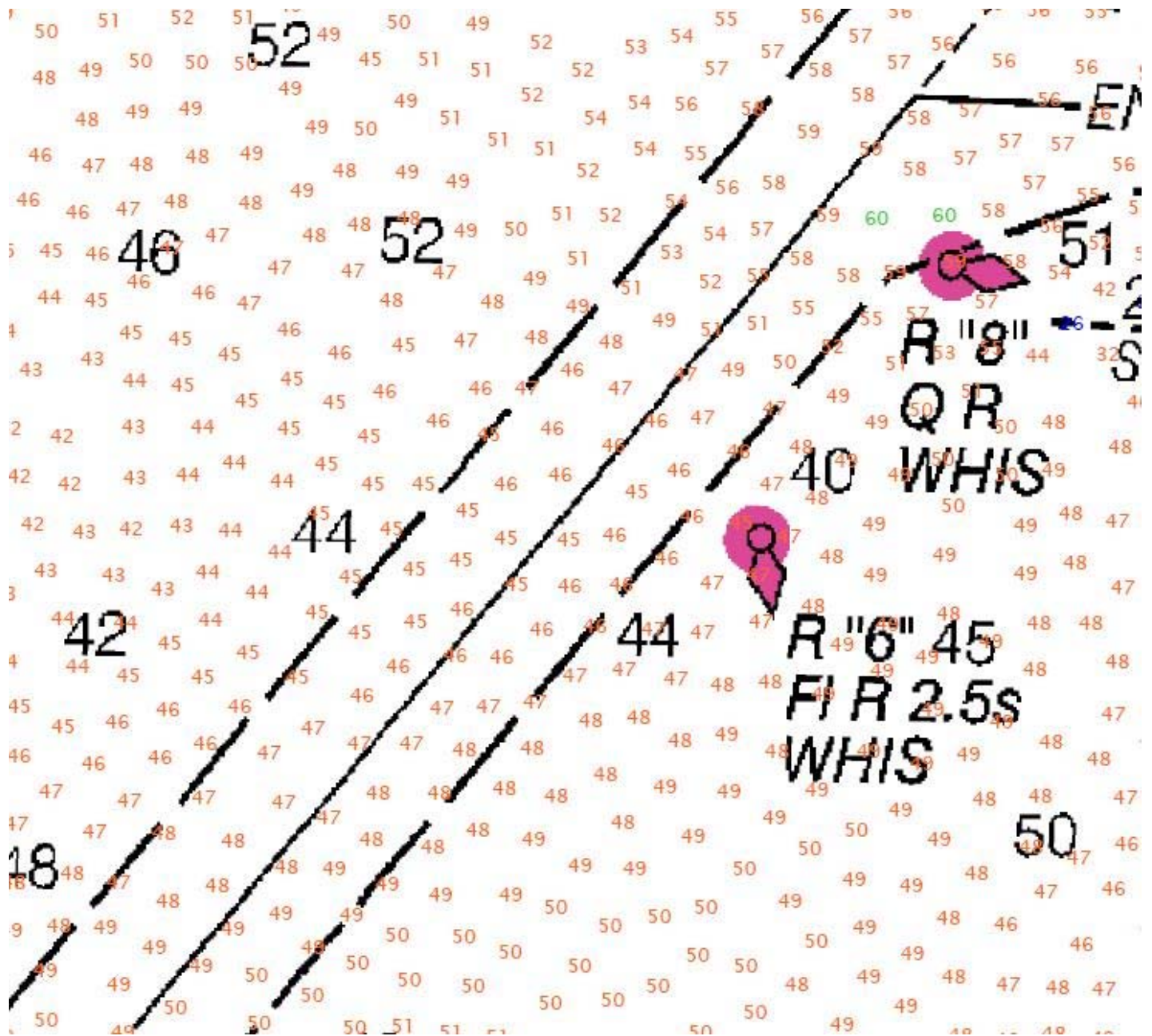
Following the analysis of data in survey H11939 (Approaches to Gray's Harbor) there were soundings noted on the plot that were shoaler than tabulated depths. The data were examined and found to be accurate. Please forward this information as appropriate to the U.S. Army Corps of Engineers and any local controlling authorities.

Attached are two depictions of the soundings. One is a general area depiction from the plot, and the other is a detailed view of the 45' soundings within an area of the channel with a 46.7' tabulated depth.

Please contact me if you have any questions about the shoaling or require any additional supporting information.

V/R,
ENS Matthew Nardi
Junior Officer, NOAA Ship Rainier





[CAPT David O. Neander <dave.neander@noaa.gov>](mailto:dave.neander@noaa.gov)
Chief
Pacific Hydrographic Branch
NOAA/NOS/OCS

H11939EntranceChannelShoaling.JPG	Content-Type: image/jpeg Content-Encoding: base64
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H11939ChannelSoundingDetail.JPG	Content-Type: image/jpeg Content-Encoding: base64
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Subject: RE: [Fwd: H11939 Entrance Channel Shoaling]

From: "Arden, Hiram T NWS" <Hiram.T.Ardens@usace.army.mil>

Date: Wed, 01 Apr 2009 12:56:08 -0700

To: David Neander <Dave.Neander@noaa.gov>

CC: "Szelest, Thomas J NWS" <Thomas.J.Szelest@nws02.usace.army.mil>, CO.Rainier@noaa.gov, Matthew.Nardi@noaa.gov, FOO Rainier <FOO.Rainier@noaa.gov>, "Reid-Pell, Lonnie M NWS" <Lonnie.M.Reid-Pell@usace.army.mil>, "Kinared, Karry H NWS" <Karry.H.Kinared@usace.army.mil>, "Garity, Thomas W NWS" <Thomas.W.Garity@usace.army.mil>

Hi Dave,

Our Gov't Hopper dredge ESSAYONS will start O&M dredging at Grays Harbor tomorrow. The dredging assignment includes dredging in the bar shoal area reported in your email. Will be getting a post dredge of the area in about three weeks.

Thanks, Hiram

Hiram Arden
US Army Corps of Engineers
Navigation Section
206.764.3401
Fax 206.764.3308

-----Original Message-----

From: David Neander [<mailto:Dave.Neander@noaa.gov>]

Sent: Wednesday, April 01, 2009 10:51 AM

To: Arden, Hiram T NWS

Cc: Szelest, Thomas J NWS; CO.Rainier@noaa.gov; Matthew.Nardi@noaa.gov; FOO Rainier

Subject: [Fwd: H11939 Entrance Channel Shoaling]

Mr. Arden,

Please see email note below and attached images from the September 2008 /Rainier/ survey of the Approaches to Grays Harbor. /Rainier/ noted an area of depths shoaler than the tabulated depth in the vicinity of buoy "6". The decimated soundings in the attached graphics are a result of a full-bottom coverage survey using a Reson 7125 multibeam.

If you have any questions or would like any additional supporting information, please don't hesitate to contact myself or ENS Nardi from /Rainier/.

Thanks,
Dave

----- Original Message -----

Subject: H11939 Entrance Channel Shoaling

Date: Fri, 27 Mar 2009 17:34:26 +0000 (GMT)

From: matthew nardi <Matthew.Nardi@noaa.gov>

To: Dave.Neander@noaa.gov

CC: CO.Rainier@noaa.gov, FOO.Rainier@noaa.gov

CAPT Neander,

Following the analysis of data in survey H11939 (Approaches to Gray's Harbor) there were soundings noted on the plot that were shoaler than tabulated depths. The data were examined and found to be accurate. Please forward this information as appropriate to the U.S. Army Corps of

Engineers and any local controlling authorities.

Attached are two depictions of the soundings. One is a general area depiction from the plot, and the other is a detailed view of the 45' soundings within an area of the channel with a 46.7' tabulated depth.

Please contact me if you have any questions about the shoaling or require any additional supporting information.

V/R,

ENS Matthew Nardi

Junior Officer, NOAA Ship Rainier



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 10, 2008

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-N922-RA-2008
HYDROGRAPHIC SHEET: H11939

LOCALITY: Approaches to Grays Harbor, WA
TIME PERIOD: September 10 - 18, 2008

TIDE STATION USED: 944-1102 Westport, WA
Lat. 46° 54.3'N Long. 124° 06.3' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.538 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-N922-RA-2008, H11939, during the time period between September 10 and September 18, 2008.

Please use the zoning file "N922RA2008CORP" submitted with the project instructions for Grays Harbor, WA. Zones PAC212A and GH1 are the applicable zones for H11939.

Refer to attachments for zoning information.

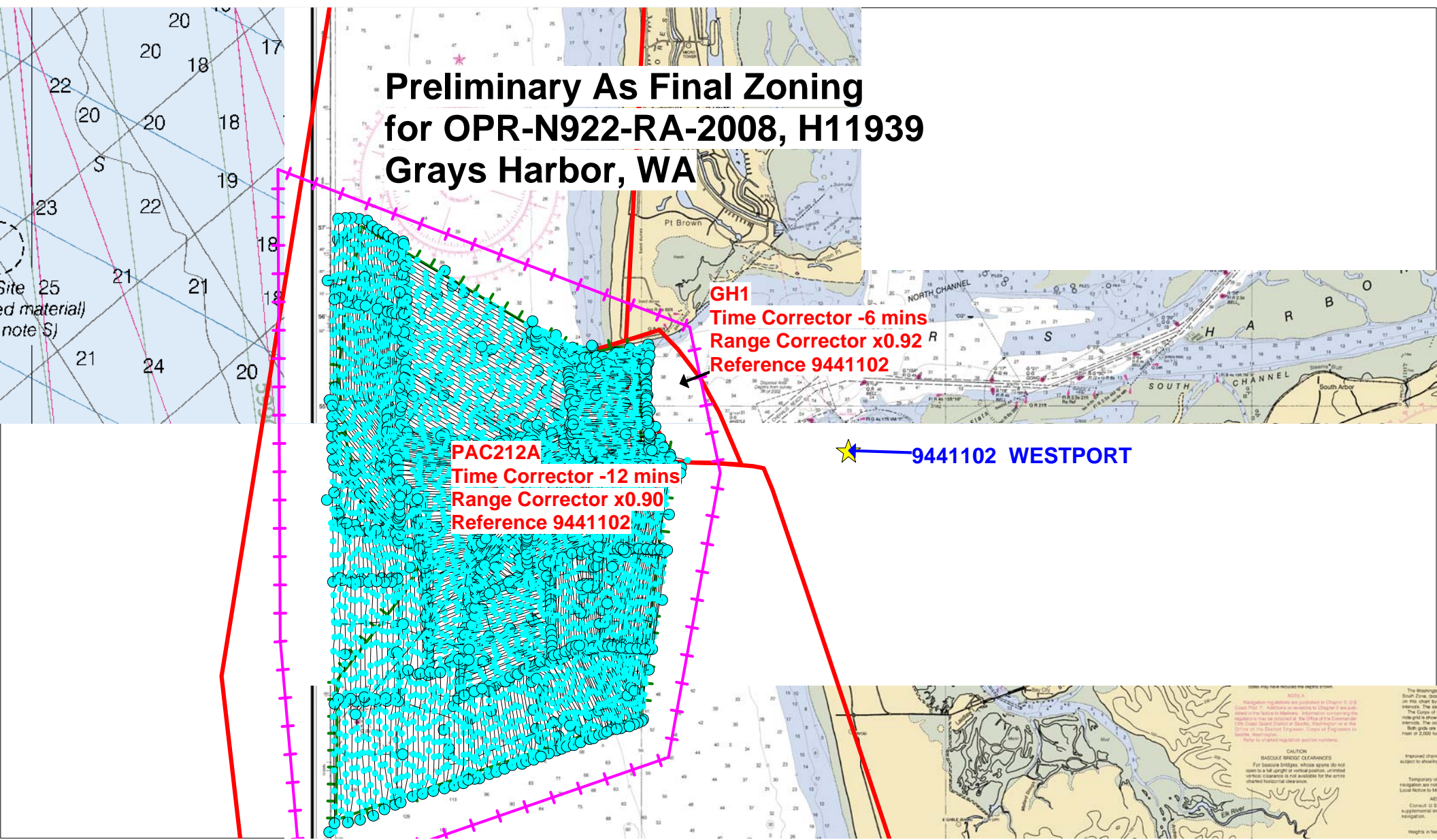
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Stephen K. Gill
Digitally signed by Stephen K. Gill
DN: c=US, st=Maryland, l=Silver Spring, ou=Center for Operational
Oceanographic Products & Serv., o=National Oceanic and Atmospheric
Administration, cn=Stephen K. Gill, email=Stephen.Gill@noaa.gov
Date: 2008.10.14 16:54:32 -0400

CHIEF, OCEANOGRAPHIC DIVISION



Preliminary As Final Zoning for OPR-N922-RA-2008, H11939 Grays Harbor, WA



H11939 HCell Report
Fernando Ortiz, Hydrographic Contractor
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11939 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March 2010.
HCell Reference Guide: Version 2.0, 22 February 2010.

2. Compilation Scale

Depths and features for HCell H11939 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
18502_1	1:40,000	86th	05/2007	075/03/2010

The following ENC's were also used during compilation:

Chart	Scale
US5WA60M	1:40,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 2-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	2
10	20	3
20	50	3.5

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

4. Depth 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. The metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in Feet from Chart 18502	Metric Equivalent to Chart Feet, Arithmetically Rounded	Metric Equivalent of Chart Feet, with NOAA Rounding Applied	Feet with NOAA Rounding Applied	Feet with NOAA Rounding Removed for Display on H11939_SS.000
6	1.8288	2.0574	6.75	6
12	3.657	3.8862	12.75	12
18	5.4864	5.715	18.75	18
30	9.144	9.3726	30.75	30
60	18.288	18.5166	60.75	60

5. Meta Areas

The following Meta object areas are included in HCell H11939:

M_QUAL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6. Features

Features addressed by the field units are delivered to PHB where they are deconflicted against the hydrography and the largest scale chart. These features, as well as features to be retained from the chart and features digitized from the Base Surface, are included in the HCell. The geometry of these features may be modified to emulate chart scale per the HCell Reference Guide on compiling features to the chart scale HCell.

7.S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_QUAL	Data quality Meta object
OBSTRN	Obstruction area object
SBDARE	Bottom samples
SOUNDG	Soundings at the chart scale density
LIGHTS	Light (Private)
SLCONS	Shoreline Construction (Jetty)
WRECKS	Wreck

The *_SS HCell contains the following Objects:

DEPCNT	Contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

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, so precision is less. 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

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

10. QA/QC and ENC Validation Checks

H11939 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to 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 are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

H11939_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000
H11939_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:1000
H11939_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11939_outline.gml	Survey outline
H11939_outline.xsd	

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 3.0	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. 2.1	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, SP 1	Validation of the base cell file.
Northport 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:

Fernando Ortiz
Hydrographic Contractor
Pacific Hydrographic Branch
Seattle, WA
206.526.6883
Fernando.ortiz@noaa.gov.

APPROVAL SHEET
H11939

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.