

H11492

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT

*Type of Survey* ..... Hydrographic Survey

*Field No.* ..... N/A

*Registry No.* ..... H11492

### LOCALITY

*State* ..... Alaska

*General Locality* ..... Eastern Prince William Sound

*Sublocality* ..... Boulder Bay

2005

### CHIEF OF PARTY

..... Commander Guy T. Noll, NOAA

### LIBRARY & ARCHIVES

DATE .....

<p style="text-align: center;">U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION</p> <p style="text-align: center;"><b>HYDROGRAPHIC TITLE SHEET</b></p>	<p>REGISTRY No</p> <p style="text-align: center;"><b>H11492</b></p>
<p><b>INSTRUCTIONS</b> – The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.</p>	<p>FIELD No: N/A</p>
<p>State <u>Alaska</u></p> <p>General Locality <u>Eastern Prince William Sound</u></p> <p>Sub-Locality <u>Boulder Bay</u></p> <p>Scale <u>1:10,000</u> Date of Survey <u>September 6 to October 3, 2005</u></p> <p>Instructions dated <u>8/3/2005</u> Project No. <u>OPR-P132-RA-05</u></p> <p>Vessel <u>RA5 (1006), RA6 (1015), RA4 (1016), RA3 (1021), RA1 (1101), RA2 (1103)</u></p> <p>Chief of party <u>Commander Guy T. Noll, NOAA</u></p> <p>Surveyed by <u>RAINIER Personnel</u></p> <p>Soundings by <u>Reson SeaBat 8101, Seabeam/Elac 1180, Reson SeaBat 8125, Knudsen 320M</u></p> <p>SAR by <u>Martha Herzog</u> Compilation by <u>Toshi Wozumi</u></p> <p>Soundings compiled in <u>Fathoms</u></p>	
<p><b>REMARKS:</b> <u>All times are UTC. UTM Projection 06</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>	

# **Descriptive Report to Accompany Hydrographic Survey H11492**

Project OPR-P132-RA-05  
Boulder Bay  
Eastern Prince William Sound, Alaska  
Scale 1:10,000  
September-October 2005  
**NOAA Ship RAINIER (s221)**  
Chief of Party: Commander Guy T. Noll, NOAA

## **A. AREA SURVEYED**

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-132-RA-05 dated August 03, 2005, and all other applicable direction<sup>1</sup>, with the exception of deviations noted in this report. The survey area is Boulder Bay, located in Eastern Prince William Sound. This survey corresponds to sheet "L" in the sheet layout provided with the Letter Instructions. OPR-P132-RA-05 responds to requests from the U.S. Coast Guard and the Alaskan Marine Highway system.

One hundred percent multi-beam echosounder (MBES) coverage was obtained in the survey area in waters 8 meters and deeper, with the exception of areas noted in Section B.2. In depths less than 8 meters additional MBES coverage was obtained to acquire least depths over significant features or shoals, with the exception of those areas discussed in Section B.2. Except as noted below, vertical-beam echo sounder (VBES) data were acquired in depths from 4 to 20 meters to define the navigable area limit, aid in the planning of SWMB data acquisition, and provide inshore bathymetry in navigationally significant areas.

Limited Shoreline Verification was performed for the survey.

Data acquisition was conducted from September 6 to October 3, 2005 (DN 250-276).

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<sup>1</sup> Standing Instructions for Hydrographic Surveys (March 2004), NOS Hydrographic Surveys Specifications and Deliverables (March 2004), OCS Field Procedures Manual for Hydrographic Surveying (March 2005), and all Hydrographic Surveys Technical Directives issued through November 2005.

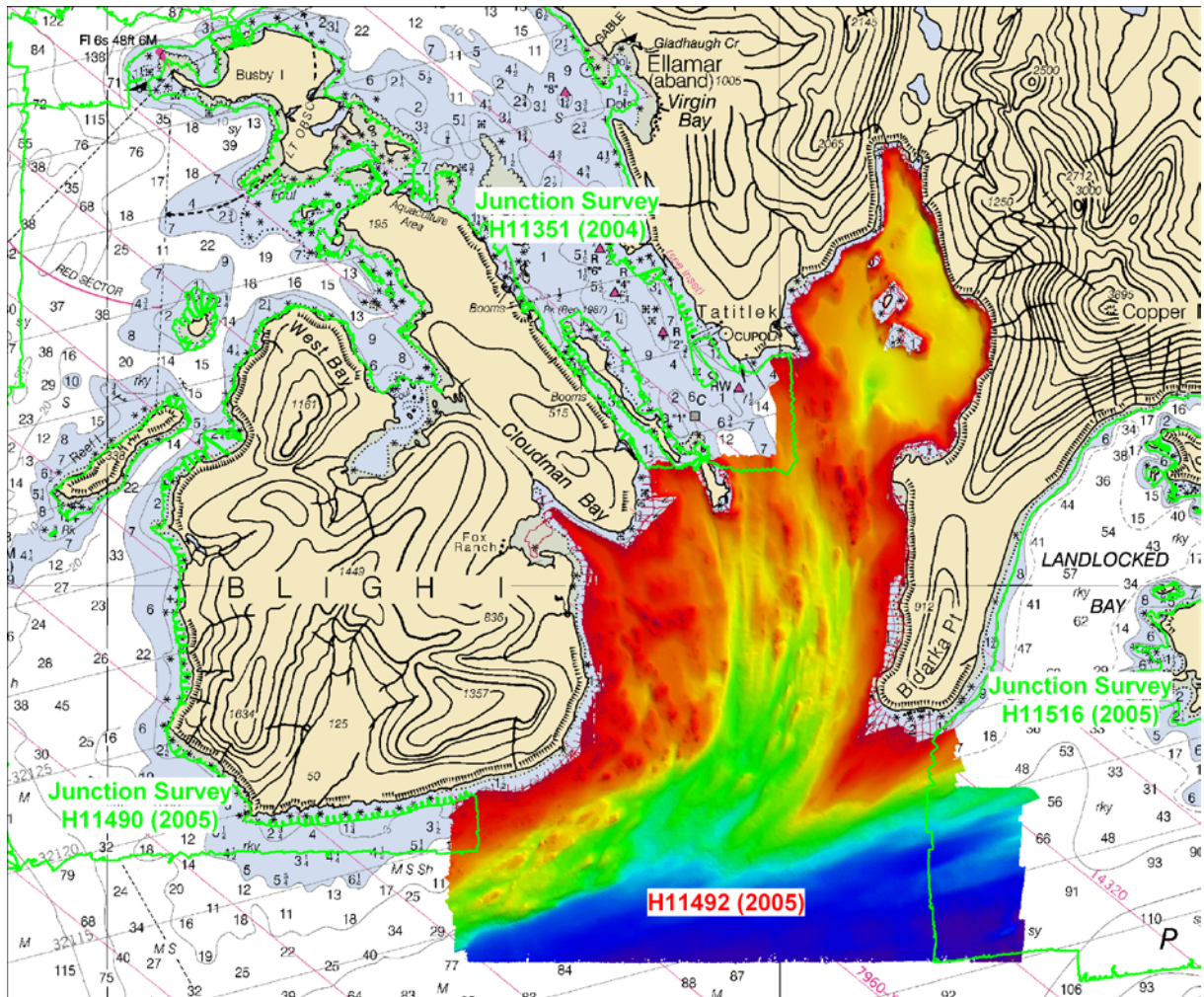


Figure 1. H11492 Survey limits and junctions overlaid on chart 16708.

## 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-P132-RA-05 Data Acquisition and Processing Report (DAPR)*<sup>1</sup>, submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report 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 Bottom Samples
1021	RA-3	Multi-Beam Echosounder
1016	RA-4	Multi-Beam Echosounder
1006	RA-5	Multi-Beam Echosounder
1015	RA-6	Multi-Beam Echosounder

*Table 1. Data Acquisition Vessels for H11492.*

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

No unusual vessel configurations were used for data acquisition.

## **B2. Quality Control**

### **Crosslines**

Vertical Beam Echo Sounder (VBES) crosslines including buffer lines totaled 17.98 nautical miles, comprising 5.73% of mainscheme hydrography. Crossline and Main Scheme bathymetry were manually compared in CARIS HIPS Subset Mode. Crosslines generally agreed within 1 meter of mainscheme hydrography.

No Shallow-Water Multibeam (SWMB) crosslines were run during the course of this survey. VBES crosslines were used in place of SWMB because of time constraints and availability of launches.

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 2006 Hydrographic System Readiness Review package submitted with this survey.

### **Junctions**

The following contemporary surveys junctions with H11492 (See Figure 1)<sup>2</sup>:

<b>Registry #</b>	<b>Scale</b>	<b>Date</b>	<b>Junction side</b>
H11490	1:10,000	2005	West
H11351	1:10,000	2004	North
H11516	1:10,000	2005	East

Surveys H11490 and H11516 were accomplished in parallel with H11492. Bathymetry was compared in CARIS HIPS subset mode, with excellent agreement observed. H11490 differed

from H11492 by half a meter or less in the common area. There were no discernable differences between H11492 and H11516.<sup>3</sup>

Survey H11351 was compared to H11492 by viewing smooth sheet soundings in Mapinfo. This comparison indicated differences of generally less than one meter in the common area.<sup>4</sup>

### Data Quality Factors

No unusual conditions were encountered during the survey that significantly affected the expected accuracy and quality of survey data.

### Minor Holidays and Inshore Coverage Gaps

RAINIER was forced to leave the project area earlier than planned due to impending inclement weather. As a result, some inshore holidays and gaps in coverage occurred.

The holidays are approximately 20m or less in width. Outer beam soundings have been re-accepted to fill the gaps where data were of sufficient quality. With the exception of the cases described below, backscatter imagery across these holidays shows no indication of obstructions and the bathymetry on either side does not indicate shoaling. The hydrographer considers this coverage to be adequate, and recommends all charted and prior survey data be superseded in the holiday areas.<sup>5</sup>

There are three cases of potentially significant holidays over offshore rocky outcroppings. In each case, a small (~5-10m wide) gap in MBES coverage occurred at the top of the outcrop. These holidays were not apparent until the data were fully processed and viewed at the appropriate final BASE surface resolution (0.5m). By this time, RAINIER had left the survey grounds due to the weather conditions discussed above, and it was not possible to obtain additional coverage. These holidays are detailed in Table 2 and illustrated in Figure 2.

<b>Position</b>	<b>Survey Least Depth</b>	<b>Charted Depth</b>
60° 49' 41.58" N 146° 42' 08.46" W	7.1m (3fm 5ft)	6fm
60° 49' 41.70" N 146° 41' 54.55" W	8.5m (4fm)	4fm 5ft
60° 50' 32.46" N 146° 38' 54.63" W	6.6m (3fm 3ft)	4fm

*Table 2. Significant Holidays*

In all three cases, the bathymetry obtained is sufficiently shoal to indicate the safe navigation route around these features on the nautical chart. The hydrographer recommends charting these soundings without qualification.<sup>6</sup> The hydrographer further recommends that all three features be added to the AWOIS database for further investigation when field units return to Port Fidalgo to complete the remaining surveys in this area. Diving for confirmation of least depth is recommended.<sup>7</sup>

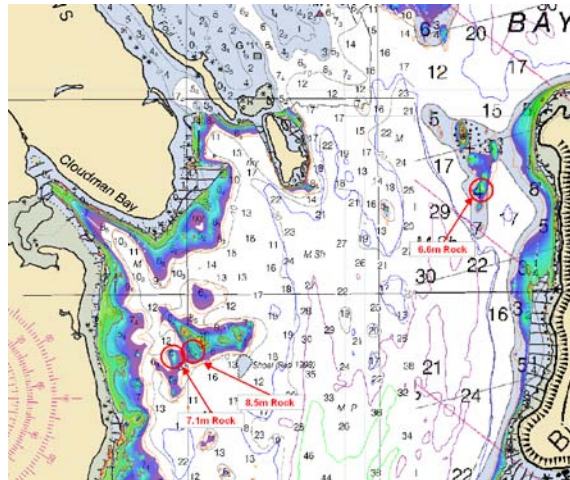


Figure 2. 0.5m BASE Surface, showing positions of significant holidays.

Figure 3. shows several areas where MBES coverage was not completed to the 8m contour and inshore VBES coverage was accomplished only to 100m line spacing rather than 25m line spacing, as required by the Letter Instructions. The hydrographer recommends that unaddressed charted features in these areas be retained.<sup>8</sup>

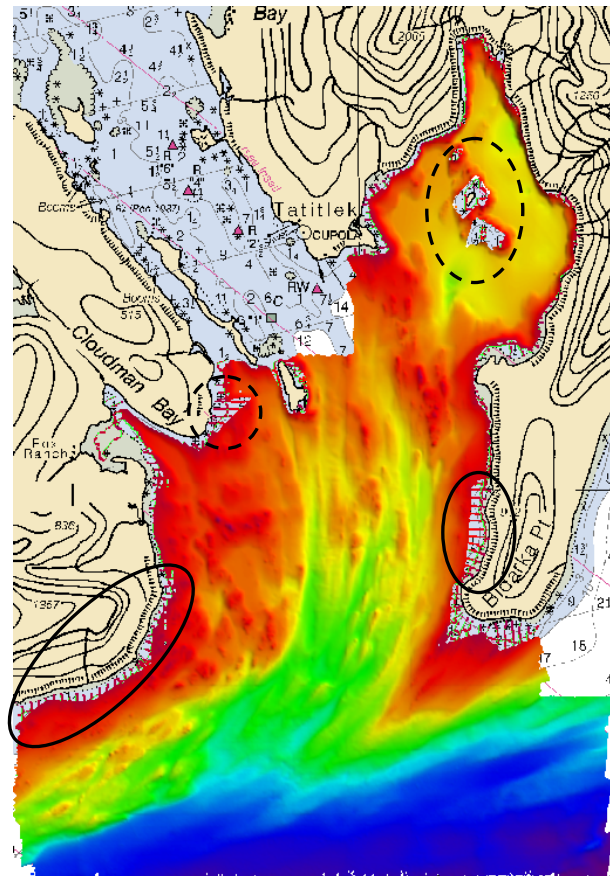


Figure 3. Areas of incomplete coverage. Solid ellipses are significant areas of VBES coverage at line spacing greater than 25m. Dashed ellipses are significant areas where 100% MBES coverage did not extend inshore to the 8m curve.

**B3. Data Reduction**

Data reduction procedures for survey H11492 conform to those detailed in the *OPR-P132-RA-05 DAPR*.

**B4. Data Representation**

Many BASE surfaces were used in processing H11492. Final BASE surface resolutions and depth ranges were set in accordance with the Field Procedures Manual, with the exception of the 5m resolution surface, which was extended to the maximum depth on the survey of approximately 170m. A 10m resolution surface was not created.

Soundings and contours 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.

The submission field sheet and BASE Surface structure are shown in Figures 4 and the field sheet layouts are shown in Figure 5.

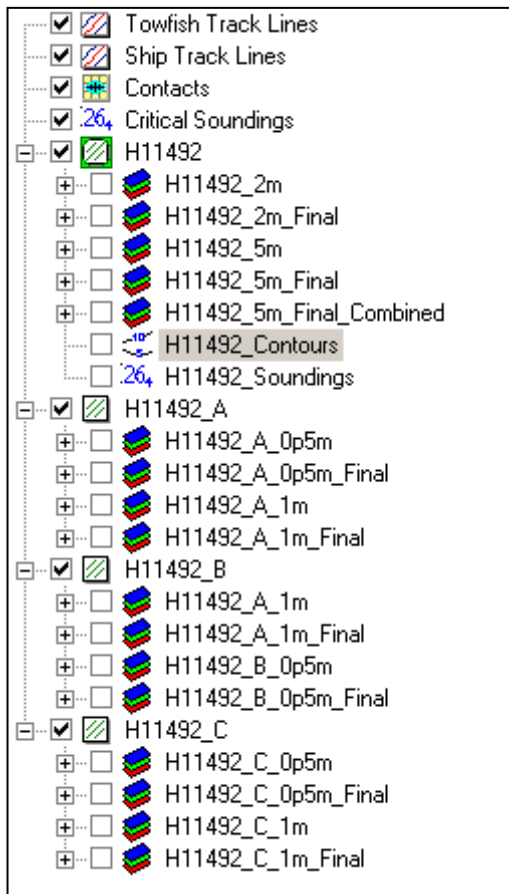


Figure 4. Field sheets and BASE surfaces submitted with H11492

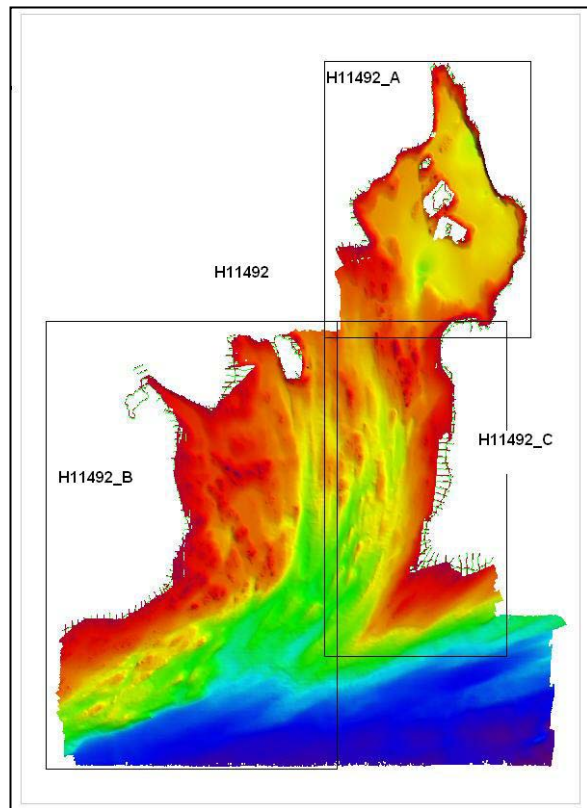


Figure 5. Layout of field sheets for H11492



### C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11492 can be found in the *OPR-P132-RA-05 Horizontal and Vertical Control Report*<sup>9</sup>, submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

#### 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 3.

Location	Frequency	Custodian	Distance	Priority
Cape Hinchinbrook	292 kHz	USCG	36NM	Primary
Potato Point	298 kHz	USCG	15NM	Secondary

Table 3. Differential Corrector Sources for H11492.

The Cape Hinchinbrook beacon was used as the primary corrector source for this survey despite the longer distance from the survey grounds because of the more robust view of the satellite constellation available at this site.

#### 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 Valdez, AK (945-4240) served as control for datum determination and as the primary source for water level reducers for survey H11492.

RAINIER personnel installed two Sutron 8210 “bubbler” tide gauges at the same site for redundancy at the following subordinate station in accordance with the Letter Instructions (see Table 4). This station is described in detail in the *OPR-P132-RA-05 Horizontal and Vertical Control Report*.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Columbia Bay Glacier 1, AK	944- 44601	30-day	August 31 <sup>st</sup> , 2005	October 3 <sup>rd</sup> , 2005
Columbia Bay Glacier 2, AK	944- 44602	30-day	August 31 <sup>st</sup> , 2005	October 3 <sup>rd</sup> , 2005

Table 4. Tide Stations installed by RAINIER personnel for H11492.

All bathymetry and elevations were reduced to MLLW using **FINAL APPROVED WATER LEVELS** from stations Columbia Bay Glacier, AK (944-4460) (computed from both gauge data sets) and Valdez, AK (945-4240) using verified tide files 9454460.tid and 9454240.tid.

Time and height correctors were from final zone corrector file H11492CORF.zdf.

A request for delivery of final approved water levels for survey H11492 was forwarded to N/OPS1 on October 14, 2005 and water level data were received by RAINIER on February 21<sup>st</sup>, 2006.<sup>10</sup> A copy of the request is included in Appendix IV.

The Columbia Glacier tide gauge was disassembled and removed at 2048 UTC on October 3, 2005 (DN 276) after consultation with CO-OPS and on the completion of the surveys in that area. Data acquisition on H11492 continued through 0109 UTC on DN277. The final ZDF file for survey H11492 supplied by CO-OPS designates the Columbia Glacier station (945-4460) as the primary station, and the Valdez station (945-4240) as the secondary station for water level application.

When applying water level correctors to bathymetric data, Caris HIPS 5.4.1 applies water levels from the station designated as primary in the .ZDF file unless there is a gap in this data, in which case it switches to the secondary station. However, since the data missing from the Columbia Bay water levels for H11492 is at the end of the times series, there is no gap, and therefore the program does not switch to the secondary gauge data. A “tide data out of range” error is produced when the water levels are applied. In order to solve this processing problem, a gap was manually created in the primary station data (Columbia Glacier 945-4460) by appending a false data point 24 hours after the last recorded water level. This point was given a value of 20 meters, which is significantly different from the measured water levels. The 20-meter water level value was chosen to ensure that there would be a detectable error if Caris HIPS 5.4.1 interpolated between primary station data points rather than switching to the secondary station. This obviously erroneous value would also alert any reviewer to the manual entry of the final data point. This “workaround” process required by a deficiency in the data processing software allowed successful application of final approved water levels to the data, and is not an error in the acquired data set.

Although this software bug was fixed in later versions of HIPS 5.4, it was reintroduced in HIPS version 6.0. A request for a hot fix (Caris request #00601774) was again made on June 26, 2006, but is still outstanding at the time of this report.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1. Chart Comparison**

#### **D.1.a. Survey Agreement with Chart**

Survey H11492 was compared with the following largest scale chart of the survey area:

Chart	Scale	Edition and Date	Latest Notice to Mariners Applied
16708	1:80,000	26 <sup>th</sup> Ed, Oct 2004	5/20/2006

*Table 5. Chart compared with H11492.*

Depths from survey H11492 are generally within one to two fathoms agreement with chart 16708, including the portion of the survey covered by the 1:40,000 scale inset of Tatilek Narrows.

Three noteworthy discrepancies are listed below:

- As noted in the Shoreline Verification discussion in Section D.2.b. below, horizontal positions of features and soundings portrayed on the chart appear to be shifted southwest by approximately 80m from their surveyed positions. This creates the impression of significant discrepancies between charted depths and survey soundings in some areas of particularly rugged bathymetry.<sup>11</sup>
- The southwest arm of Cloudman Bay (near the charted Fox Ranch) is charted as a mud flat, but was found to include an inner lagoon of relatively deep water (centered at approximate position 60° 50' 24" N, 146° 43' 37" W). Only limited sounding work was accomplished in this area, but a single line of VBES bathymetry was run around the perimeter of the navigable water. The hydrographer recommends that charted mud flat be amended to reflect these data, and that survey soundings supersede charted depths in the common area.<sup>12</sup>
- In several areas it appears that shoal soundings from prior surveys have been moved offshore on the current edition of the chart. This effect is particularly apparent on the east side of outer Boulder Bay, creating the impression of discrepancies between charted depths and survey soundings of up to 6 fathoms. The hydrographer recommends that survey soundings supersede charted depths in the common area.<sup>13</sup>

The hydrographer recommends that survey soundings supersede all prior surveys and charted depths in the common area, with the exceptions noted in Section B.2. above.<sup>14</sup>

#### **D.1.b. Dangers to Navigation**

Two (2) Dangers to Navigation (DTONs) were identified in survey H11492 and reported to the Marine Chart Division via email on December 12, 2006. The original DTON submission package is included in Appendix I. Descriptions of each DTON are included in the H11492 DTON Report in Appendix I.<sup>15</sup>

#### **D.1.c. Other Features**

##### Automated Wreck and Obstruction Information System (AWOIS) Investigations

Two (2) AWOIS items fall within the survey limits of H11492. Both were assigned for full investigation and completed. Descriptions of each AWOIS item investigation are included in the Survey Feature Report in Appendix II.<sup>16</sup>

## **D.2. Additional Results**

### **D.2.a. Prior Survey Comparison**

Prior survey comparison with H11492 was not performed.

### **D.2.b. Shoreline Verification**

#### Shoreline Source

Vector photogrammetric data from projects AK210 and AK310 were supplied by N/NGS3 in the form of digital Cartographic Feature Files (CFF) GC10540 and GC10560, respectively. RAINIER conducted limited shoreline verification of the CFF. In addition, features and shoreline shown on the current editions of chart 16708 that were not depicted on the shoreline source document were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification.

#### Shoreline Verification

Limited shoreline verification was conducted near predicted low water in accordance with the Standing Project Instructions and FPM sections 6.1 and 6.2. Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms, processed in Pydro, and then translated into CARIS Notebook. These DPs 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, and transferred to the “remrks” attribute on the corresponding features in Notebook. DP forms are included in the Detached Position directory of the *Separates to be Included with Survey Data*.

All shoreline data is submitted in Caris Notebook .hob files, collected in session file H11492\_L\_NTBK. The contents of this session are listed in Table 6.

<b>HOB File</b>	<b>Purpose and Contents</b>
H11492_CFF_Shoreline	CFF shoreline and point features that did not require revision or were not addressed.
H11492_CFF_ShorelineHOB (marker layer) <sup>17</sup>	Additional hydrographer notes on object in H11516_M_CFF_Shoreline
H11492_Chd_Shoreline	Charted shoreline and point features not included in the CFF, which did not require revision or were not addressed.
H11492_Chd_ShorelineHOB (marker layer)	Additional hydrographer notes on object in H11516_M_Chd_Shoreline
H11492_Add_Notebook	New features and changes to the shoreline that did not require a DP.
H11492_Add_Pydro	New features which required a DP and were therefore processed in Pydro.
H11492_Modify_Notebook	Features found to be accurately positioned in source data or on the chart, but incorrectly classified or attributed. (Example: a rock that was actually the high point of a reef or ledge.)
H11492_Modify_Pydro	Features that were accurately positioned in source data or on the chart, but were found to have missing or incorrect height/depth attribution, and were therefore “DPed for height.”
H11492_Delete_Pydro	Disprovals processed in Pydro.
H11492_Delete_Notebook	Source data and charted shoreline and features found to be inadequately positioned or disproved without a DP.
H11492_None_Pydro	Verified charted or CFF source features processed in Pydro.

Table 6. List and Description of Notebook HOB files.

**Note:** Final approved water levels have been applied to survey H11492. All elevation and depth values on Notebook features have been updated to reflect these correctors. “DPs for height” have been removed from Notebook, but are retained in the Pydro PSS.

In the Pydro PSS, the combination of *modify*, *add*, and *none* layers depict the shoreline as surveyed. The *delete* tables depict all disproved or modified features.

#### Source Shoreline Changes and New Features

The charted rock (16708) at 60°52'27.944"N, 146°38'53.131"W was disproved by conducting 100% SWMB coverage over the area. Sea conditions were flat to one-foot swells. Water visibility in this area was clear 3 meters. The Hydrographer recommends removing this rock from the chart.<sup>18</sup>

The charted reported shoal at 60°49'37.550"N, 146°41'24.987"W was disproved by conducting 100% SWMB coverage over the area. Sea conditions were flat to one foot swells and water visibility in this area was clear to the depth of three meters. The Hydrographer believes this reported shoal correlates with the charted (16708) 2.5 fathom sounding located 200 meters north at 60°49'46.14" N, 146°41'25.32" W. The Hydrographer recommends removing the reported shoal from all charts.<sup>19</sup>

Several derelict piles were observed during shoreline verification in the head of Cloudman Bay, in approximate position 60° 50' 17.0" N, 146° 43' 59.7" W. These piles were above the MLLW line and too far inshore to investigate by boat, and no further positioning work was accomplished. The piles are of limited use as a landmark and do not pose a hazard to navigation. The hydrographer recommends that no features be charted at this position.<sup>20</sup>

Items for survey H11492 that require further discussion, and are associated with a detached position have been flagged "Report" in Pydro in H11492.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.<sup>21</sup>

### Recommendations

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 noted.<sup>22</sup>

#### **D.2.c. Aids to Navigation**

There are no Aids to Navigation within the limits of H11492.<sup>23</sup>

#### **D.2.d. Overhead features**

There are no overhead features in survey H11492.<sup>24</sup>

#### **D.2.e. Submarine Cables and Pipelines**

There are no submarine cables or pipelines charted within the limits of H11492, and none were detected by the survey.<sup>25</sup>

#### **D.2.f. Ferry Routes**

There are no charted ferry routes within the limits of H11492.<sup>26</sup> The Alaska Marine Highway System operates scheduled ferry service through the survey area on the Cordova-Tatitlek-Valdez route.

**D.2.g. Bottom Samples**

Nine bottom samples were collected on this survey. In most cases bottom samples that were collected were in agreement with charted bottom characteristics.<sup>27</sup> Refer to the Survey Feature Report in Appendix II for a detailed list of bottom samples.

**D.2.h Miscellaneous**

Several areas that were observed to have eelgrass were noted in the CFF\_Edited\_ShorelineHOB file marker layer.<sup>28</sup>

**E. ADDITIONAL DOCUMENTATION**

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- P132-RA-05	10/4/06	N/CS34
Horizontal and Vertical Control Report for OPR- P132-RA-05	06/02/06	N/CS34
Tides and Water Levels Package for OPR- P132-RA-05	10/11/05	N/OPS1
Coast Pilot Report for OPR- P132-RA-05	08/18/06	N/CS26



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Office of Marine and Aviation Operations  
NOAA Ship RAINIER (S221)  
1801 Fairview Ave E, Seattle, WA 98102

December 15, 2006

**MEMORANDUM FOR:** CDR Donald W. Haines, NOAA  
Chief, Pacific Hydrographic Branch

**FROM:** CDR Guy T. Noll, NOAA  
Commanding Officer

**SUBJECT:** Approval of Hydrographic Survey H11492

Field operations for hydrographic survey H11492 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, Field Procedures Manual, Standing and Letter Instructions, and HSD Technical Directives. These data are adequate to supersede charted data in their common areas with the exception of deficiencies noted in the Descriptive Report. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

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

Survey Sheet Manager:

Matthew Foss  
Hydrographic Survey Technician

Tides Officer:

Nicola Samuelson FOR  
Lieutenant Junior Grade, NOAA

Horizontal Control Officer:

Andrew P. Halbach FOR  
Lieutenant Junior Grade, NOAA

Chief Survey Technician:

James B. Jacobson  
Chief Survey Technician, NOAA Ship RAINIER

Field Operations Officer:

Benjamin K. Evans  
Lieutenant, NOAA





## Revisions Compiled During Office Processing and Certification

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<sup>1</sup> Filed with project records.

<sup>2</sup> In addition to the listed junction surveys, there are two more adjoining surveys that have been compiled to HCells.

<u>Register#</u>	<u>Scale</u>	<u>Date</u>	<u>Junction Side</u>
H11742	10,000	10/10/2007	South
H11743	10,000	10/03/2008	Southwest

<sup>3</sup> Concur.

<sup>4</sup> Concur.

<sup>5</sup> Concur.

<sup>6</sup> Concur.

<sup>7</sup> Concur with clarification. Full multibeam coverage is sufficient for least depth determination.

<sup>8</sup> Concur.

<sup>9</sup> Filed with project records.

<sup>10</sup> Tide note is appended to this report.

<sup>11</sup> Concur.

<sup>12</sup> Do not concur. VBES bathymetry is not adequate to revise the charted mud flat. Mud flat should be retained as charted.

<sup>13</sup> Concur.

<sup>14</sup> Concur.

<sup>15</sup> Dton report is appended to this report.

<sup>16</sup> AWOIS feature report is appended to this report.

<sup>17</sup> This digital file was not submitted by the field unit.

<sup>18</sup> Concur.

<sup>19</sup> Concur.

<sup>20</sup> Concur with clarification. There are no charted features in this location.

<sup>21</sup> The features report is not attached as features described in the H11492 Survey Features Report do not represent a complete listing of features compiled to the HCell. Additional features were added, some removed, and some modified in characterization for depiction at chart scale. A final accounting of features addressed by the survey and/or compiled to the HCell are included as Blue Notes and as NINFOM attributes for all features.

<sup>22</sup> Concur.

<sup>23</sup> Concur.

<sup>24</sup> Concur.

<sup>25</sup> Concur.

<sup>26</sup> Concur.

<sup>27</sup> Seven bottom samples from chart 16708 and seven new bottom samples from the present survey were imported into the HCell.

<sup>28</sup> This file did not contain any data.

# H11492 Dangers to Navigation

**Registry Number:** H11492  
**State:** AK  
**Locality:** SE PWS  
**Sub-locality:** Boulder Bay  
**Project Number:** OPR-P132-RA-05  
**Survey Date:** 09/16/2005

## Charts Affected

Number	Version	Date	Scale
16708	26th Ed.	10/01/2004	1:40000
16700	29th Ed.	07/01/2004	1:200000
16013	29th Ed.	11/01/2003	1:969761
531	22nd Ed.	03/01/2004	1:2100000
500	8th Ed.	06/01/2003	1:3500000
50	6th Ed.	06/01/2003	1:10000000

## Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	10.05 m	060° 51' 21.390" N	146° 39' 30.536" W	---
1.2	Sounding	14.31 m	060° 48' 36.537" N	146° 39' 05.643" W	---

## **1 - Danger To Navigation**

## 1.1) Profile/Beam - 454/55 from h11492 / 1021\_reson8101\_hvf / 2005-259 / 342\_2153

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 060° 51' 21.390" N, 146° 39' 30.536" W  
**Least Depth:** 10.05 m  
**Timestamp:** 2005-259.21:54:23.835 (09/16/2005)  
**Survey Line:** h11492 / 1021\_reson8101\_hvf / 2005-259 / 342\_2153  
**Profile/Beam:** 454/55  
**Charts Affected:** 16708\_1, 16700\_1, 16013\_1, 531\_1, 500\_1, 50\_1

#### Remarks:

Designated sounding on shoal. Selected as DTON during CO review.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11492/1021_reson8101_hvf/2005-259/342_2153	454/55	0.00	000.0	Primary

#### Hydrographer Recommendations

Chart sounding only.

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

5 ½fm (16708\_1, 16700\_1, 16013\_1)

5fm 3ft (531\_1)

10.0m (500\_1, 50\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 TECSOU - 3:found by multi-beam

## 1.2) Profile/Beam - 455/27 from h11492 / 1021\_reson8101\_hvf / 2005-259 / 500\_1617

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 060° 48' 36.537" N, 146° 39' 05.643" W  
**Least Depth:** 14.31 m  
**Timestamp:** 2005-259.16:18:21.348 (09/16/2005)  
**Survey Line:** h11492 / 1021\_reson8101\_hvf / 2005-259 / 500\_1617  
**Profile/Beam:** 455/27  
**Charts Affected:** 16708\_1, 16700\_1, 16013\_1, 531\_1, 500\_1, 50\_1

#### Remarks:

Designated sounding on shoal. Selected as DTON during CO review.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
h11492/1021_reson8101_hvf/2005-259/500_1617	455/27	0.00	000.0	Primary

#### Hydrographer Recommendations

Chart sounding only.

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

7 ¾fm (16708\_1, 16700\_1, 16013\_1)

7fm 5ft (531\_1)

14.3m (500\_1, 50\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** QUASOU - 1:depth known  
 TECSOU - 3:found by multi-beam

## **3 - AWOIS Features**

### 3.1) AWOIS #53132 - OBSTRUCTION

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

**Search Position:** 60.86611111° N, 146.66222222° W  
**Historical Depth:** [None]  
**Search Radius:** 200  
**Search Technique:** VS, MB, DI  
**Technique Notes:** [None]

**History Notes:**

CL 1111/98, 07/17/98; REPORTS THE AUTHORIZATION FOR THE TATITLEK CORP. TO CONSTRUCT A 12 ACER MARICULTURE FARM WITH THE APPROX. CENTER OF LAT 60/51/58 N., LON 146/39/44 W. (NAD 83). (ENT KRW 06/04)

#### Survey Summary

**Charts Affected:** 16708\_2, 16708\_1, 16700\_1, 16013\_1, 531\_1, 500\_1, 50\_1

**Remarks:**

History CL 1111/98, 07/17/98; REPORTS THE AUTHORIZATION FOR THE TATITLEK CORP. TO CONSTRUCT A 12 ACER MARICULTURE FARM WITH THE APPROX. CENTER OF LAT 60/51/58 N., LON 146/39/44 W. (NAD 83). (ENT KRW 06/04)

Investigation Summary: Fish Pen noted as charted.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
H11492_AWOIS.mdb	AWOIS # 53132	0.00	000.0	Primary

#### Hydrographer Recommendations

Retain as charted

#### S-57 Data

**Geo object 1:** Cartographic symbol (\$CSYMB)

### 3.2) AWOIS #53133 - OBSTRUCTION

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

**Search Position:** 60.82722222° N, 146.69027778° W  
**Historical Depth:** [None]  
**Search Radius:** 200  
**Search Technique:** MB, ES, DI  
**Technique Notes:** [None]

**History Notes:**

BP 181462, 10/22/03; INDICATES A SHOAL IN LAT60/49/38 N., LON 146/41/25 W. (NAD 83). (ENT KRW 06/04)

#### Survey Summary

**Charts Affected:** 16708\_2, 16708\_1, 16700\_1, 16013\_1, 531\_1, 500\_1, 50\_1

**Remarks:**

History BP 181462, 10/22/03; INDICATES A SHOAL IN LAT60/49/38 N., LON 146/41/25 W. (NAD 83). (ENT KRW 06/04)

Investigation Summary: The shoal area was covered with 100% SWMB. No distinct feature was found within the shoal area. Survey soundings within the shoal area were consistent with surrounding charted depths, and were found to gradually shoal toward the charted submerged reef ~250m to the north.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
H11492_AWOIS.mdb	AWOIS # 53133	0.00	000.0	Primary

#### Hydrographer Recommendations

Remove charted shoal and note from the chart (16708).

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)





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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** January 12, 2006

**HYDROGRAPHIC BRANCH:** Pacific  
**HYDROGRAPHIC PROJECT:** OPR-P132-RA-2005  
**HYDROGRAPHIC SHEET:** H11492

**LOCALITY:** Boulder Bay, Prince William Sound, AK  
**TIME PERIOD:** September 8 - October 4, 2005

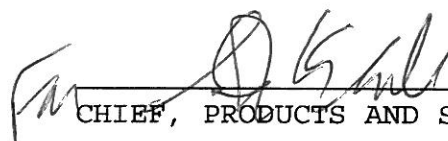
**TIDE STATION USED:** Columbia Glacier, AK 945-4460  
Lat. 61 01.4' N Long. 147 05.1' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 3.384 meters

**TIDE STATION USED:** Valdez, AK 945-4240  
Lat. 61 07.5' N Long. 146 21.8' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 3.417 meters

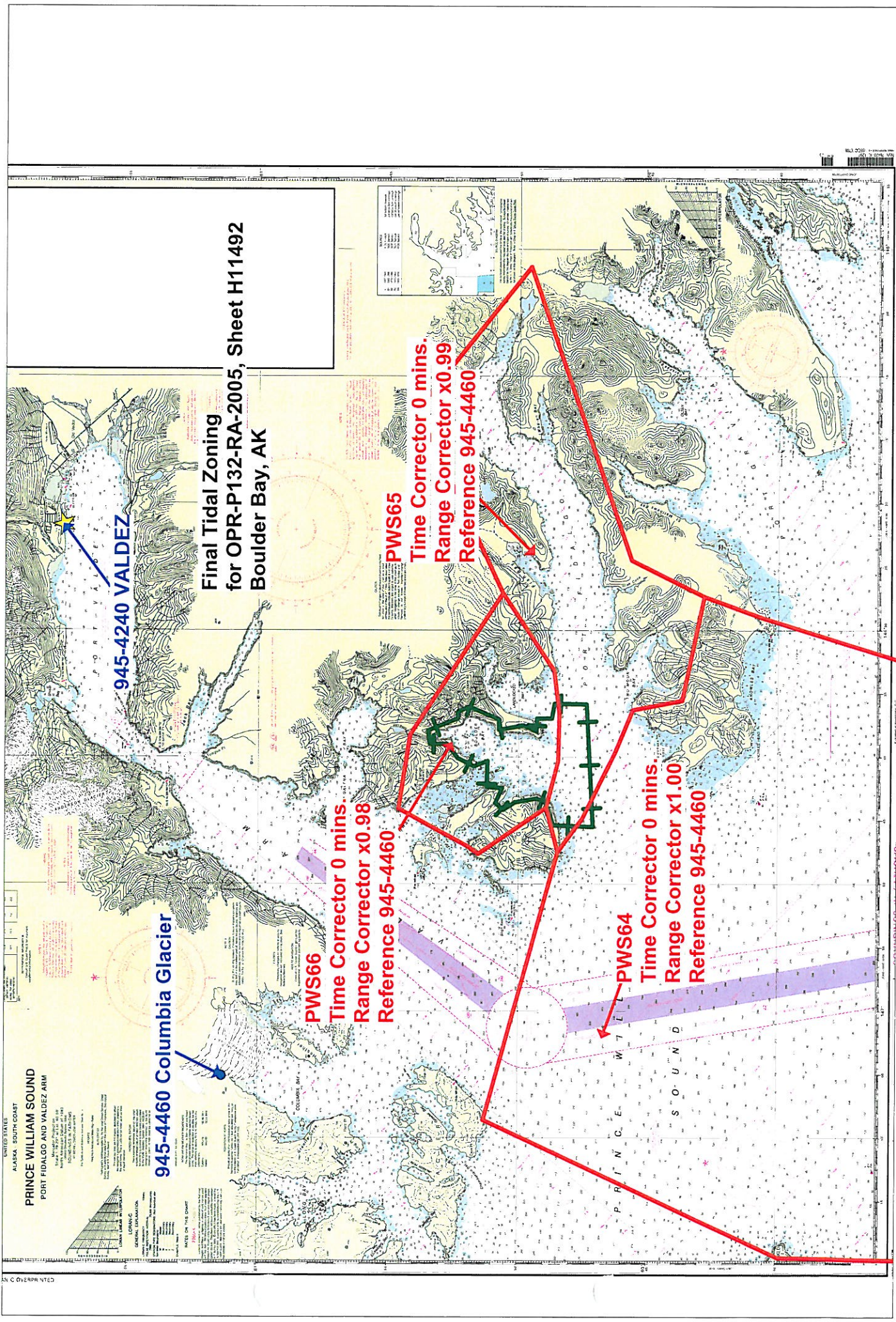
**REMARKS: RECOMMENDED ZONING**  
Use zone(s) identified as: PWS64, PWS65, & PWS66

**Refer to attachments for zoning information.**

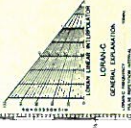
- Note 1:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).
- Note 2:** Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector file (\*.ZDF). For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

  
\_\_\_\_\_  
CHIEF, PRODUCTS AND SERVICES DIVISION





UNITED STATES  
ALASKA SOUTH COAST  
PRINCE WILLIAM SOUND  
PORT FIDALGO AND VALDEZ ARM



**945-4460 Columbia Glacier**

**945-4240 VALDEZ**

**Final Tidal Zoning  
for OPR-P132-RA-2005, Sheet H11492  
Boulder Bay, AK**

**PWS66  
Time Corrector 0 mins.  
Range Corrector x0.98  
Reference 945-4460**

**PWS65  
Time Corrector 0 mins.  
Range Corrector x0.99  
Reference 945-4460**

**PWS64  
Time Corrector 0 mins.  
Range Corrector x1.00  
Reference 945-4460**

**H11492 HCell Report**  
Toshi Wozumi, Physical Scientist  
Pacific Hydrographic Branch

**1. Specifications, Standards and Guidance Used in HCell Compilation**

HCell compilation of survey H11492 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.  
HCell Reference Guide: Version 2.0, June 2, 2010.

**2. Compilation Scale**

Depths and features for HCell H11492 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16708	1:79,291	27th	11/01/2008	02/23/2010
16708 (inset)	1:40,000	27th	11/01/2008	02/23/2010

The following ENC's were also used during compilation:

Chart	Scale
US4AK24M	1:40,000

**3. Soundings**

A survey-scale sounding (SOUNDG) feature object layer was built from the 5-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:15,000 and 1:40,000 survey scale using a Radius Table file with values shown in the table, below.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	200	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 H11492\_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 Fathoms from Chart 16708	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H11492_SS.000
0	0	0.000	0.000	0
3	5.4864	5.715	3.125	3
5	9.144	9.373	5.125	5
10	18.288	18.517	10.125	10
20	36.576	37.948	20.750	20
50	91.44	92.812	50.750	50
100	182.88	184.252	100.750	100

With the exception of the zero contours included in the H11492\_CS file, contours have not been deconflicted against shoreline features, soundings and hydrography, as all other features in the H11492\_CS file and soundings in the H11492\_SS have been. This may result in conflicts between the H11492\_SS file contours and HCell features at or near the survey limits. Conflicts with M\_QUAL, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over H11492\_SS.000 file contours in all cases where conflicts are found.

#### 5. Meta Areas

The following Meta object areas are included in HCell H11492:

M\_QUAL  
M\_CSCL

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.

There are three instances where bottom samples were incorrectly digitized on the ENC. Blue Notes were placed on these items to indicate removal of the current features. It is recommended that these bottom samples be correctly digitized by encoding multiple descriptions in NATSUR.

## 7. S-57 Objects and Attributes

The H11492\_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
COALNE	Modified GC coastline
DEPCNT	Modified GC MLLW
MARCUL	Fish Pen
M_CSCL	Compilation scale Meta area to define an inset, and for
M_QUAL	Data quality Meta object
OBSTRN	Obstruction area object
SBDARE	Modified GC ledges and reefs, bottom samples, and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Rock features

The H11492\_SS HCell contains the following Objects:

DEPCNT	Generalized 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):	Fathoms and 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

H11492 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

H11492_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000 and 1:79,291.
H11492_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:15,000 and 1:40,000.
H11492_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items.
H11492_outline.gml	Survey outline
H11492_outline.xsd	Survey outline

### 11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	Creation of soundings and bathy-derived features, 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:

Toshi Wozumi  
Physical Scientist  
Pacific Hydrographic Branch  
Seattle, WA  
206-526-4763  
[Toshi.Wozumi@noaa.gov](mailto:Toshi.Wozumi@noaa.gov).

APPROVAL SHEET  
H11492

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.