

H11106

NOAA FORM 78-35A

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

## DESCRIPTIVE REPORT

*Type of Survey*      **Hydrographic**

*Field No.*            **RA-10-04-02**

*Registry No.*        **H11106**

### LOCALITY

*State*                **Alaska**

*General Locality*    **Peril Strait**

*Sublocality*        **Povorotni Island to Emmons Island**

**2002**

### CHIEF OF PARTY

**Captain James C. Gardner, NOAA**

### LIBRARY & ARCHIVES

DATE

## HYDROGRAPHIC TITLE SHEET

H-11106

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-10-04-02

State AlaskaGeneral Locality Peril StraitSublocality Povorotni Island to Emmons IslandScale 1:10,000Date of Survey 4/9-26/2002Instructions Date 3/21/2002Project No. OPR-0112-RA-02Vessel NOAA Ship Rainier (2120) and launches 2121,2122,2123,2124,2127Chief of Party Captain J. C. Gardner, NOAASurveyed by Ship personnel and physical scientists from Pacific Hydrographic BranchSoundings taken by echo sounder, hand lead, pole Knudsen 320M, RESON 8101, RESON 8125Graphic record scaled by RAINIER PersonnelGraphic record checked by RAINIER PersonnelEvaluation by L. DeodatoAutomated plot by HP DesignJet 1050Verification by L. Deodato, R. Davies, G. NelsonSoundings in Fathoms

at

MLLWREMARKS: Time in UTC.

Revisions and annotations appearing as endnotes were generated  
during office processing.

All depths listed in this report are referenced to  
mean lower low water unless otherwise noted.

# Descriptive Report to Accompany Hydrographic Survey H11106

Project OPR-O112-RA-02

Sitka Sound, Alaska

Scale 1:10,000

April-May 2002

**NOAA Ship RAINIER**

Chief of Party: Captain James C. Gardner, NOAA

## A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-RA-02, dated March 21, 2002, and the Draft Standing Project Instructions dated March 21, 2001. The survey area is located north of Sitka in Peril Strait, from Povorotni Island to Emmons Island. This survey corresponds to sheet “B” in the sheet layout provided with the Letter Instructions.

One hundred percent shallow-water multibeam (SWMB) coverage was obtained in the survey area in waters 8 meters and deeper. In waters from 4 meters to 8 meters, SWMB data were obtained at 25-meter line spacing, and in these areas additional coverage was obtained to obtain least depths over features or shoals. Vertical-beam echo sounder (VBES) data were acquired in depths from 4 to 50 meters to define the four-meter curve and to aid in the planning of SWMB data acquisition.

Data acquisition was conducted from April 9 to April 26, 2002 (DN 099 to 116).

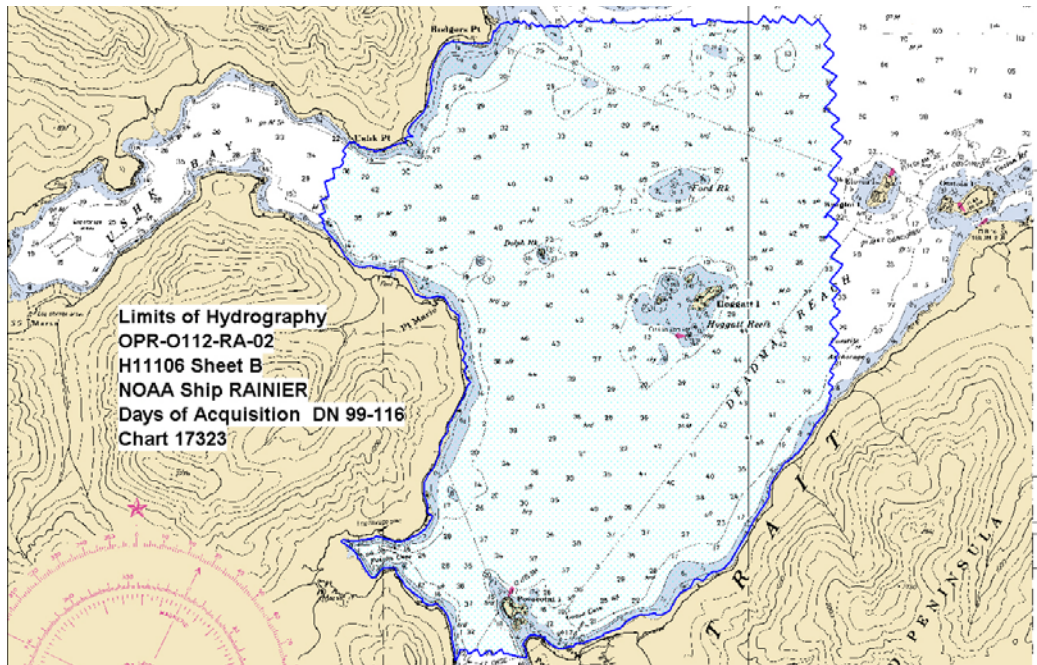


Figure 1. H11106 Survey Limits

## 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-O112-RA-02 Data Acquisition and Processing Report*, submitted under separate cover. Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

### B1. Equipment and Vessels

Data were acquired by RAINIER and her survey launches (vessel numbers 2120, 2121, 2122, 2123, 2124, 2125, and 2127). Vessels 2123, 2124 and 2125 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessels 2121 and 2122 were used to acquire vertical-beam echo soundings (VBES) and detached positions (DPs) for shoreline verification. Vessel 2127 was also used to acquire detached positions (DPs) for shoreline verification. Vessel 2120 was used to collect bottom samples. No unusual vessel configurations or problems were encountered during this survey.

### B2. Quality Control

#### Crosslines

Vertical Beam Echo Sounder (VBES) crosslines totaled 8.23 nautical miles, comprising 19.4% of mainscheme hydrography. Crosslines generally agreed within 1 meter of mainscheme hydrography.<sup>1</sup>

Shallow-Water Multibeam (SWMB) crosslines totaled 19.50 nautical miles, comprising 8.32% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 98.74606%, with a depth tolerance factor of 0.013, which conforms to International Hydrographic Organization Order 1 specifications detailed in Special Publication S-44, Edition 4, as well as NOS Hydrographic Surveys Specifications and Deliverables Manual. See Appendix V<sup>2</sup> for the detailed report.

#### Junctions<sup>3</sup>

The following contemporary survey junctions with H11106:

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11105	1:10,000	2002	East
H11107	1:10,000	2002	West
H11108	1:10,000	2002	South

Survey H11106 junctions well with these surveys, a cursory comparison indicates differences are generally less than one fathom.<sup>4</sup>

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after the application of smooth tides.<sup>5</sup>

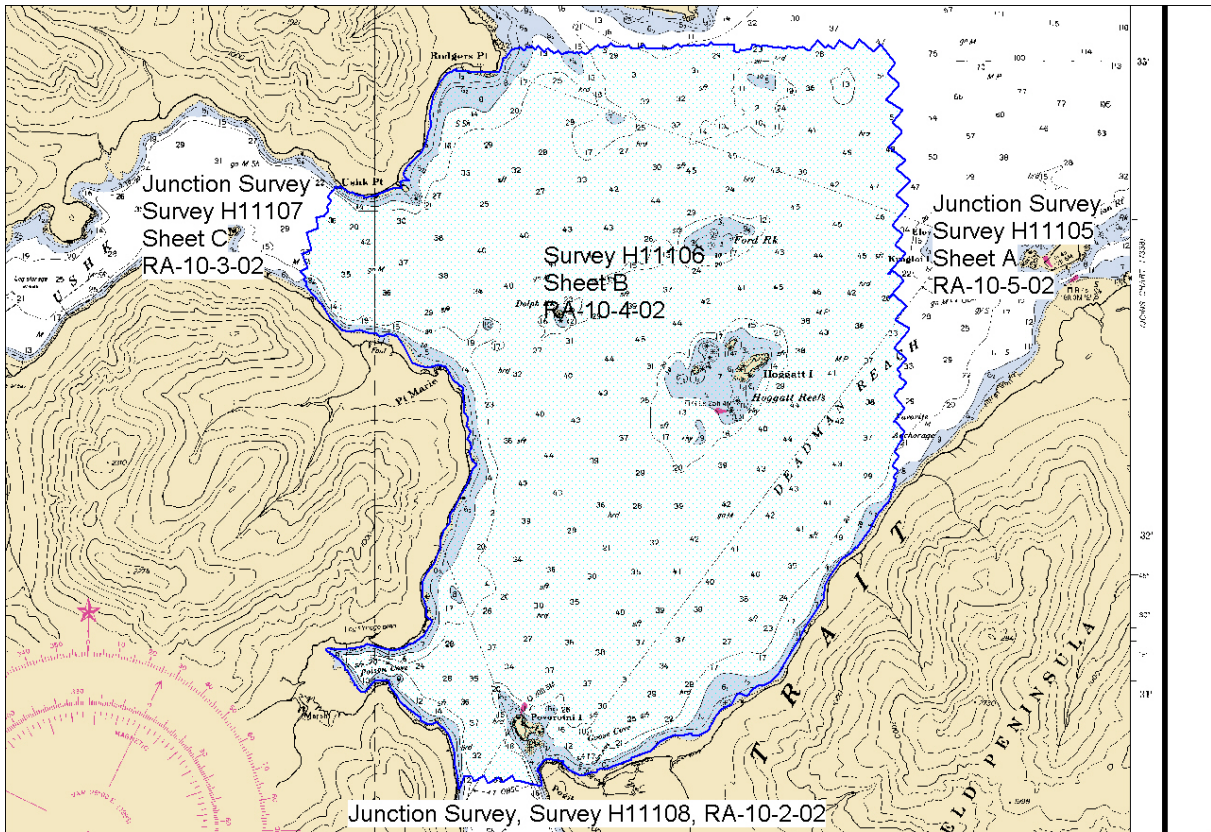


Figure 2. H11106 Junction Surveys.

### Data Quality Factors

No unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data.<sup>6</sup>

### B3. Data Reduction

Data reduction procedures for survey H11106 conform to those detailed in the *OPR-O112-RA-02 Data Acquisition and Processing Report*.

## C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11106 can be found in the *OPR-O112-RA-02 Horizontal and Vertical Control Report*, 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. Differential corrections from U.S. Coast Guard beacon at Biorka Island (305 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacon Level Island (295 kHz) as the check station were performed weekly in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-O112-RA-02 Horizontal and Vertical Control Report*.

**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 Sitka, AK (945-1600) served as control for datum determination and as the primary source for water level reducers for survey H11106.

RAINIER personnel installed Sutron 8210 “bubbler” tide gauges at the following subordinate stations to provide information for N/OPS1 to determine time and height correctors in accordance with the Project Instructions:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Povorotni Island	945-1936	30-day	March 31, 2002	May 22, 2002

All data were reduced to approximate MLLW using unverified observed tides from station Povorotni Island, AK (945-1936), adjusted using a height ratio corrector of 1.00 and a time corrector of -1.0 minutes. These data were used in creating the tide corrector file "H11106\_Observed.tid."

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing.<sup>7</sup> A request for delivery of final approved (smooth) tides for survey H11106 was forwarded to N/OPS1 on May 6, 2002 in accordance with FPM 4.8.<sup>8</sup> A copy of the request is included in Appendix IV<sup>9</sup>.

**D. RESULTS AND RECOMMENDATIONS<sup>10</sup>**

**D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations**

A total of one (1) AWOIS item was located within the limits of H11106 and investigated during this survey. Investigation methods, results, and charting recommendations have been entered into the Microsoft Access AWOIS database and are submitted with the digital data. Printouts of the AWOIS Database forms are included in Appendix VI of this report.<sup>11</sup>

## D.2 Chart Comparison

Survey H11106 was compared with charts 17323 (11<sup>th</sup> Ed.; October 1, 2004, 1:40,000), and chart 17320 (16<sup>th</sup> Ed.; December 1, 2003, 1:217,828).

### Chart 17323

Depths from Survey H11106 generally agreed with Chart 17323 within 1 fathom. The only exceptions occurred in areas of steeply sloping shoreline where the Survey depths exceeded the Charted depths by approximately 1-3 fathoms. This is attributed a multibeam sonar having a smaller beam width than a single beam sonar, resulting in a smaller and more precise area of seafloor being measured by the multibeam sonar.

The Hydrographer has determined that data accuracy standards and bottom coverage requirements have been met and survey data are adequate to supersede charted data in their common areas.<sup>12</sup>

The charted (17323) log storage area at 57° 31' 13" N 135° 35' 04" W (E, N) was partially investigated at MLLW visually and the remaining submerged portion was surveyed with 100% SWMB coverage and no log storage activity was found. Sea conditions were flat and water visibility in this area was clear to two meters. Telephone discussion and a follow up letter from Mr. Chris Landis at the Alaska Division of Natural Resources (telephone 907 465-3400) confirm that these features were leases that have expired. A letter for documentation was requested, but has not been received. The Hydrographer recommends follow up on this matter by the Pacific Hydrographic Branch and the removal of this feature from the chart.<sup>13</sup> Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.<sup>14</sup>

### Chart 17320

Depths from Survey H11106 agree with Chart 17320 with no difference.<sup>15</sup>

## D.3 Shoreline

### Shoreline Source

A complete source shoreline for this survey was not provided. A preliminary partial digital manuscript (DM) from photogrammetric projects AK9703A (north) and A9703B (south) was supplied by N/NGS3 in the form of a cartographic feature file (CFF).<sup>16</sup> RAINIER conducted limited shoreline verification of the CFF. In the absence of CFF MHW or CFF MLLW RAINIER personnel digitized the largest scale charts in MapInfo and displayed in HYPACK for field verification. In addition, features shown on the current editions of charts 17323 and 17320 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, 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 Section I of the *Separates to be Included with Survey Data*.<sup>17</sup>

A detailed Detached Position and Bottom Sample plot, in both paper copy<sup>18</sup> and MapInfo format, is provided showing all detached positions and bottom samples with notes relating to each feature. The updated shoreline and features are also depicted on the final sounding plot. Verified CFF shoreline that did not require revision is in MapInfo table H11106\_Shoreline and shown in black. New MHW features and changes to the MHW shoreline, CFF or charted, are displayed in red<sup>19</sup> on the "H11106\_ShorelineUpdates" MapInfo table. Charted shoreline, when used for reference purposes or when source data were not available, is depicted in the MapInfo table "H11106\_ChartedShoreline" and displayed in brown.

## Source Shoreline Changes and New Features

The CFF ledge at 57° 30' 35"N, 135° 32' 54"W was found to partially be a boulder beach. A DP (Pos. #11035196)<sup>20</sup> was taken to delineate the western extent of the CFF ledge and the eastern extent of the new boulder beach. The Hydrographer recommends changing the CFF line type to reflect a boulder beach instead of a ledge.<sup>21</sup>

The CFF reef at <sup>22</sup>57° 33' 08"N, 135° 34' 14"W was found to encompass three CFF rocks in the immediate vicinity. Two DPs (Pos. #71141, #71142) were taken to establish the new extents of the reef. The Hydrographer recommends removal of the three CFF rocks and extending the reef limits as depicted on the Detached Position Shoreline plot.<sup>23</sup>

The CFF ledge at 57° 33' 08"N, 135° 34' 14"W was found to extend farther seaward than originally positioned. A DP (Pos #11035012) was taken to delineate the seaward extend of the ledge. The Hydrographer recommends changing the extent of the ledge to the position as depicted on the Detached Position Shoreline plot.<sup>24</sup>

## Charted Features

In several locations charted ledges were accurately located and extended past the CFF approximate MLLW. The Hydrographer recommends retaining as charted and depicted on the Detached Position Shoreline plot.<sup>25</sup>

The charted (17323) rock near 57° 33' 12"N, 135° 30' 50"W was found to also be represented as a CFF rock. A DP (Pos. #71144) was taken of this rock. A five minute visual search with a water visibility of 2 meters revealed no other rocks in the immediate area. The Hydrographer



recommends removal the charted rock and the CFF rock in this area and replacing it with a rock as depicted on the Detached Position Shoreline plot.<sup>26</sup>

The charted (17323) rock at 57° 33' 04"N, 135° 31' 12"W was also found to be represented as a CFF rock. A DP (Pos. #71162) was taken of this rock. A five minute visual search with a water visibility of 2 meters revealed no other rocks in the immediate area. The Hydrographer recommends removal the charted rock and the CFF rock in this area and replacing it with a rock as depicted on the Detached Position Shoreline plot.<sup>27</sup>

The charted (17323) ledge at 57° 30' 30"N, 135° 33' 04"W was seen during routine shoreline investigation to be a boulder beach. The shoreline was delineated with three positions (Pos. #11035191, #11035194, #11035196). The Hydrographer recommends deleting this charted ledge.<sup>28</sup>

### **Recommendations**

The Hydrographer recommends that the shoreline as depicted on the Detached Position and Bottom Sample plot and final sounding plot supersede and complement shoreline information compiled on the CFF and charts as noted.<sup>29</sup> In addition, field notes made by the Hydrographer, including verification of source features or charted features if no source shoreline was available are submitted in the digital MapInfo file "H11106\_ShorelineNotes."

### **D.4 Dangers to Navigation**

No dangers to navigation were found during survey H11106.<sup>30</sup>

### **D.5 Aids to Navigation**

All aids to navigation (ATONs) were found to be correctly charted and serve their intended purpose.<sup>31</sup>

All fixed ATONS were positioned using Third Order, Class 1, static GPS survey methods. See Horizontal Control Report for OPR-O112-RA-02 (to be submitted).

Povorotni Island Light (LL# 25260)	
57° 30' 51.53"N	135° 33' 19.01"W
Hoggatt Reef Light <sup>32</sup> (LL# 25263)	
57° 32' 47.94"N	135° 30' 48.47"W

### **D.6 Miscellaneous**

Bottom samples were collected and are depicted on the Detached Position and Bottom Sample Plot.<sup>33</sup>

## E. APPROVAL

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2001.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H11106 is complete and adequate to supersede charted soundings in their common areas. No additional work is required for this survey.<sup>34</sup>

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-O327-RA-01	17 June, 2002	N/CS34
Horizontal and Vertical Control Report for OPR-O327-RA-01	TBD	N/CS34
Tides and Water Levels Package for OPR-O327-RA-01	2 July, 2002	N/OPS1
Coast Pilot Report for OPR-O112-RA-02	TBD	N/CS26

Approved and Forwarded: James C. Gardner 7-1-02  
James C. Gardner  
Captain, NOAA  
Commanding Officer

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

Survey Sheet Manager: Micah D. Miller  
Micah D. Miller  
Ensign, NOAA

Field Operations Officer: Richard A. Fletcher  
Richard A. Fletcher  
Lieutenant Commander, NOAA

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### PHB Revisions

<sup>1</sup> Concur

<sup>2</sup> Filed with the hydrographic data

<sup>3</sup> The junctions with surveys H11105, H11107, and H11108 are complete. A "Joins" note has been added to the smooth where applicable.

<sup>4</sup> Concur

<sup>5</sup> Concur

<sup>6</sup> Concur

<sup>7</sup> Concur

<sup>8</sup> Approved Tide Note dated September 5, 2002 is attached

<sup>9</sup> Filed with the hydrographic data

<sup>10</sup> The present survey was compared to the following prior surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H7988	1952	1:10,000	NAD27
H7989	1952	1:10,000	NAD27
H9055	1969	1:10,000	NAD27

Sounding agreement is good with the present survey depths equal or shoaler and deeper by 1 fathom except on prior survey H7989 in the vicinity of Lat. 57°33'36.2"N, Long. 135°35'42.8"W where the present survey depth is deeper by 6-10 fathoms. These differences may be attributed to present state of the art in positioning.

Charted features originating from the above prior surveys that are recommended by the hydrographer to be retained were transferred in color to the present survey.

With the transfer of the features to the present survey, H11106 is adequate to supersede the above prior surveys within the common area.

<sup>11</sup> Copy of AWOIS item 52940 is attached

<sup>12</sup> Concur

<sup>13</sup> The log storage area will be retained as charted with "abandon" added to the note

<sup>14</sup> Concur. Charted hydrography originates with the previously discussed prior surveys and miscellaneous source data. The prior survey has been adequately addressed in endnote 10 and requires no further discussion. A charted rock at Lat. 57°30'57.7"N, Long. 135°30'42.0"W from miscellaneous source data has been retained as charted as recommended by the hydrographer. Survey H11106 is adequate to supersede charted hydrography within the charted area

<sup>15</sup> Do not concur. Depths from survey H11106 show good agreement with Chart 17320 within 1-2 fathoms.

<sup>16</sup> A final complete digital manuscript (DM) was supplied to PHB and is shown on the smooth sheet.

<sup>17</sup> Filed with the hydrographic records.

<sup>18</sup> Filed with the hydrographic records.

<sup>19</sup> The hydrographer did not locate any new MHW feature nor made changes to the MHW

<sup>20</sup> Lat. 57° 30' 34.7" N, Long. 135° 33' 01.5" W.

- 
- <sup>21</sup> Concur. See smooth sheet for depiction of area.
- <sup>22</sup> Revise GP to 57°33'23.97"N, 135°32'48.79"W
- <sup>23</sup> Concur
- <sup>24</sup> Concur
- <sup>25</sup> Concur
- <sup>26</sup> Concur
- <sup>27</sup> Concur
- <sup>28</sup> Concur
- <sup>29</sup> Concur
- <sup>30</sup> Do not concur. One danger to navigation was found during office processing. A DTON Report was submitted to N/CS26. A copy of the report is attached.
- <sup>31</sup> Concur
- <sup>32</sup> Revise light name to Hoggatt Reef Light 25
- <sup>33</sup> Bottom samples were carried through to the smooth sheet.
- <sup>34</sup> Concur

## Danger to Navigation Report

Hydrographic Survey Registry Number: H11108

Survey Title:       State:       Alaska  
                          Locality:   Peril Strait  
                          Sub-locality: Povorotni Island to Emmons Island

Project Number: DPR-O112-RA-02

Survey Dates: 4/9/02 – 4/26/02

Depths are reduced to Mean Lower Low Water using approved tides. Positions are based on the NAD83 horizontal datum.

### CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
17320	1:217,828	16th	12/01/03
17323	1:40,000	11th	10/01/04

### DANGERS:

<u>Feature</u>	<u>Depth(ft or fms)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Sounding	4 fms 2 ft	57° 34' 53.5"	135° 30' 22.8"

### COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6835

RECD 52940 VESLTERMS OBSTRUCTION CHART 17323 AREA 0  
CARTOCODE 067 SNDINGCODE DEPTH

LAT83 57/30/29.05 LONG83 135/32/27.72 NATVDATUM  
LATDEC: 57.508069444444 LONDEC: 135.541033333333 GPQUALITY Med  
GPSOURCE Direct

PROJECT OPR-O112-RA-02 ITEMSTATUS Assigned SEARCHTYPE Full  
RADIUS 250 INIT DAS ASSIGNED 2/15/2002  
TECNIQ VS, DI, S2, SWMB

Techniqnote Verify or disprove existence of charted piles in water depths less than 10 fathoms within search radius.

History History  
PH49/49 - T-9897-- T-sheet piles charted in Goose Cove.  
BP82575/67-- Note on shoreline verification "Unable to verify piles."  
Position for center of search radius scaled in MapInfo from raster chart 17323 10th ed., July 10, 1993. (ENT DAS 02/15/2002)

Fieldnote INVESTIGATION  
DATE(S): 4/13 /02 (DN: 103 )  
HYDROGRAPHIC SURVEY NUMBER: H11106  
VN: 2121 TIME: 17:29  
INVESTIGATION METHODS USED: SWMB, VS  
SURVEYED POSITION: LAT. 57-30-29.05 N LON. 135-32-27.72 W  
POSITION DETERMINED BY: DIFFERENTIAL GPS  
INVESTIGATION SUMMARY: 100% SWMB coverage was obtained in areas deep enough for safe vessel navigation. In shoaler areas visual searches were conducted. One half of the search area was above MLLW. Conditions were seas 1', swell 0'. Water visibility was 3 meters.  
CHARTING RECOMMENDATION (HYDROGRAPHER): The Hydrographer recommends removal of these charted piles.  
EVALUATOR COMMENTS: Delete piles from chart.

Proprietary

YEARSUNK NIMANUM

Print Record



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: September 5, 2002

HYDROGRAPHIC BRANCH: Pacific  
HYDROGRAPHIC PROJECT: OPR-0112-RA-2002  
HYDROGRAPHIC SHEET: H11106

LOCALITY: Peril Strait, Alaska  
TIME PERIOD: April 9 - April 26, 2002

TIDE STATION USED: 945-1936 Provorotni Island  
Lat. 57° 30.9'N Lon. 135° 33.2'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.314 meters

REMARKS: RECOMMENDED ZONING  
Use zone(s) identified as: SEA227, SEA230, SEA226

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.

*Thomas N. Meier 9/11/02*  
-----  
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION







**Final tide zone node point locations for OPR-O112-RA-2002, H11106.**


Format: Tide Station (in recommended order of use)  
 Average Time Correction (in minutes)  
 Range Correction  
 Longitude in decimal degrees (negative value denotes  
 Longitude West),  
 Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEA227	945-1936	0	1.00
-135.549428 57.509099			
-135.537977 57.497959			
-135.501086 57.517179			
-135.456591 57.547044			
-135.564807 57.585512			
-135.614753 57.610092			
-135.700053 57.584813			
-135.685211 57.527234			
-135.571262 57.512555			
-135.549428 57.509099			
Zone SEA230	945-1936	0	0.99
-135.384321 57.518655			
-135.347133 57.544947			
-135.304679 57.573584			
-135.507641 57.654798			
-135.527348 57.652064			
-135.614753 57.610092			
-135.564807 57.585512			
-135.456591 57.547044			
-135.384321 57.518655			
Zone SEA226	945-1936	0	0.99
-135.537784 57.492747			
-135.537977 57.497959			
-135.549428 57.509099			
-135.571262 57.512555			
-135.569228 57.498756			
-135.559073 57.493726			
-135.537784 57.492747			


APPROVAL SHEET  
H11106

Initial Approvals:

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

  
\_\_\_\_\_  
Russ Davies Date: 4/8/05  
Cartographic Team  
Pacific Hydrographic Branch

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

  
\_\_\_\_\_  
Donald W. Haines Date: 12 APR 2005  
CDR, NOAA  
Chief, Pacific Hydrographic Branch

