

H11578

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. H11578

LOCALITY

State Alaska

General Locality Keku Strait

Sublocality Rocky Pass to Dakaneek Bay

2006

CHIEF OF PARTY

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

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28
(11-72)

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

REGISTRY No

HYDROGRAPHIC TITLE SHEET

H11578

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

State Alaska

General Locality Keku Strait

Sub-Locality Rocky Pass to Dakaneek Bay

Scale 1:10,000 Date of Survey April 17, 2006 - June 7, 2006

Instructions dated 4/11/2006 Project No. OPR-O180-RA-06

Vessel RAINIER

Chief of party Commander Guy T. Noll, NOAA

Surveyed by RAINIER Personnel

Soundings by echo sounder, hand lead, pole Reson SEABAT 8101, Seabeam/Elac 1180, Reson SeaBat 8125, Knudsen 320M

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel Automated Plot N/A

Verification by Bonnie Johnston Evaluation By Sarah Wolfskehl

Soundings in Feet at MLLW

REMARKS: All times are UTC.

The purpose of this survey was 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.

Descriptive Report to Accompany Hydrographic Survey H11578

Project OPR-O180-RA-06
Keku Strait, Alaska
Rocky Pass to Dakaneek Bay
Scale 1:10,000
April-June 2006
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-O180-RA-06 dated April 11, 2006 and all other applicable direction¹, with the exception of deviations noted in this report. The survey area is in Keku Strait near Entrance Island from Rocky Pass to Dakaneek Bay. This survey corresponds to survey "A" in the sheet layout provided with the Letter Instructions. OPR-O180-RA-06 responds to a request from the United States Coast Guard Cutter ELDERBERRY which reported that many of the shoals in Keku Strait extend offshore of their charted positions.

The area surveyed is shown in Figure 1. The area seaward of the 4m curve and offshore of the Navigable Area Limit Line (NALL) was surveyed with a combination of 100% multibeam echosounder (MBES) and 200% side scan sonar (SSS) coverage. RAINIER defined the NALL in accordance with field hydrographer observations, approximately following the farthest offshore of (1) the 4-meter depth contour, (2) the line defined by the distance seaward from the MHW line which is equivalent to 0.8 millimeters at the scale of the largest scale nautical chart (16 m for chart 17372), and (3) the inshore limit of safe navigation for RAINIER's survey launches. Two hundred percent side scan with "skunk stripe" multibeam was obtained in lieu of one hundred percent MBES in two shallow bays away from the main channel. Additional MBES coverage was obtained to acquire least depths over significant features or shoals. Vertical beam echo sounder (VBES) data were acquired to define the navigable area limit, aid in the planning of MBES data acquisition, and provide inshore bathymetry in navigationally significant areas. Limited Shoreline Verification was performed for the survey area.

Data acquisition was conducted from April 17-June 8 2006 (DN107-DN159).

Data Acquisition Type	Hull Number with Mileage (nm)						Total
	1101	1103	1021	1016	1006	1015	
MBES (mainscheme)	-	-	26.2	70.0	113.7	-	209.9
SSS + MBES (mainscheme)	-	-	-	-	-	35.4	35.4
VBES (mainscheme)	-	-	-	-	-	-	0
Crosslines (nm)	17.9	34.9	-	-	5.0	-	47.7
Shoreline (nm)	8.4	20.8	-	-	-	-	29.2
Bottom Samples	-	15	-	-	-	-	15
Total Number of Items Investigated	8	17	-	-	-	-	25
Total Area Surveyed (sq. nm)	-	-	-	-	-	-	9.0

Table 1. Statistics for survey H11578.

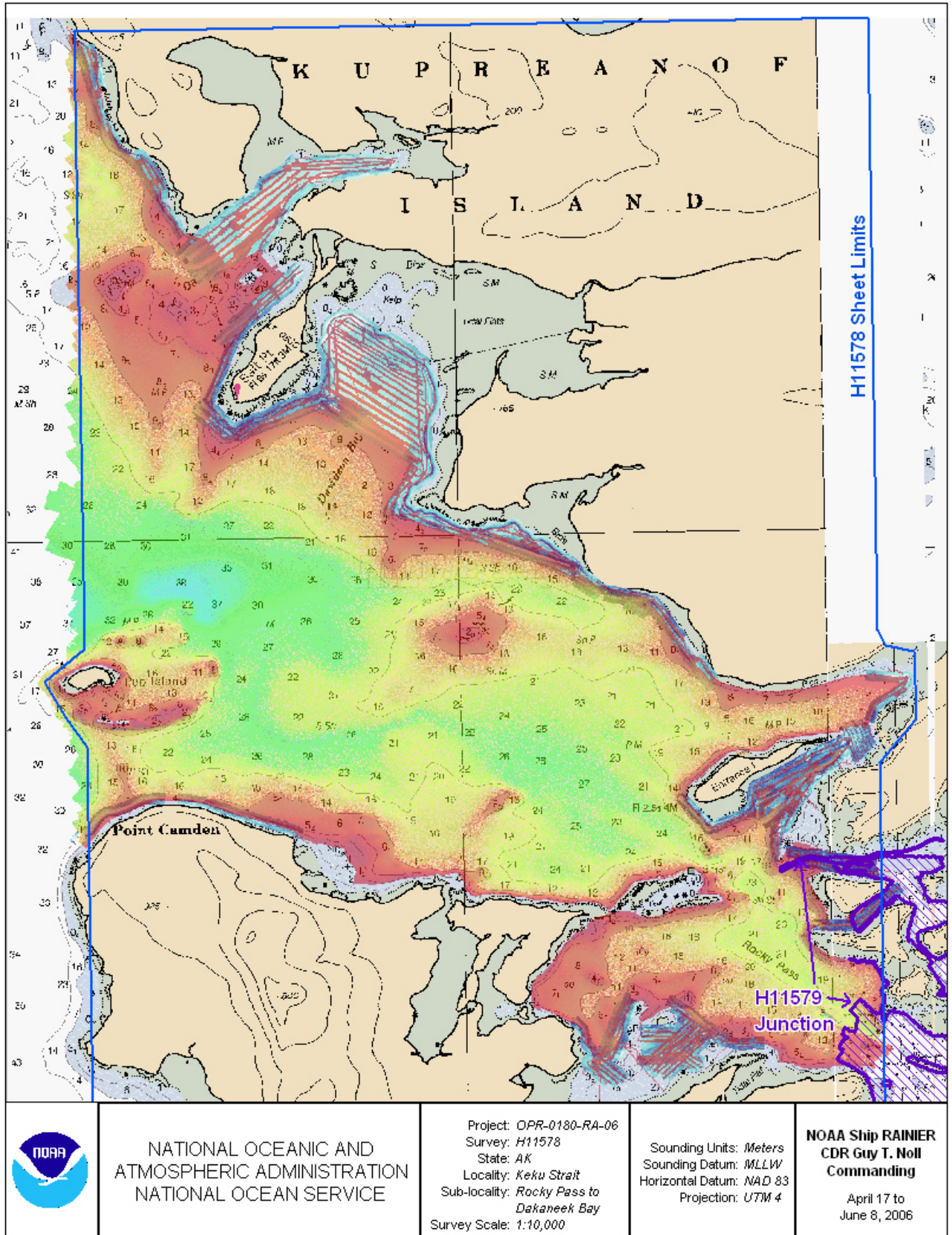


Figure 1. H11578 Survey Limits (Charts 17368 & 17372).

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-0180-RA-06 Data Acquisition and Processing Report (DAPR)*², 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 Side Scan Sonar Detached Positions
1103	RA-2	Vertical beam Echosounder Detached Positions Bottom Samples
1021	RA-3	Multibeam Echosounder
1016	RA-4	Multibeam Echosounder
1006	RA-5	Multibeam Echosounder
1015	RA-6	Multibeam Echosounder Side Scan Sonar

Table 2. Data Acquisition Vessels for H11578.

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

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Multibeam echosounder and vertical beam echosounder crosslines totaled 38.5 nautical miles, comprising 8% of mainscheme hydrography. Crossline and Main Scheme bathymetry were manually compared in CARIS HIPS Subset Mode. Crosslines generally agreed with mainscheme hydrography to within 0.25m in all depth ranges³.

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 RAINIER Hydrographic System Readiness Review package⁴ submitted with this survey.

Junctions

The following contemporary surveys junctions with H11579 (See Figure 1):

<u>Registry #</u>	<u>Scale</u>	<u>Date</u>	<u>Junction side</u>
H11579	1:10,000	2006	Southeast

Survey H11579 compares well with this survey. A one meter base surface was made of the common area using both datasets and examined for jump discontinuities. None were found. In addition, the data was examined using the Caris subset tool. Disagreements between the surveys were generally less than 0.15 meters, and in all cases less than 0.3 meters. There are no gaps in coverage between the survey areas.

Data Quality Factors

ELAC True Heave Error

TrueHeave correctors were not applied to Elac data due to an offset between the time stamps on the TrueHeave data and the Elac data as converted in Caris Hips & Sips 6.0. This offset is approximately 14 seconds. Launch 1015 (RA-6) is the only vessel which acquired Elac data for this survey. Throughout the project, TrueHeave was recorded on launch 1015 but TrueHeave correctors were not applied to the HDCS data. All of the bathymetry acquired with the Elac system was in conjunction with the hull mounted SSS. In most cases, any heave artifacts in the bathymetry were less than 0.2 meters⁵.

Limited Inshore Coverage

Coverage was obtained as specified in the Project Instructions in all areas except the shallow bay southwest of Rocky Pass (see Figure 2). This area is largely enclosed by rocky outcroppings and reefs, limiting the maneuverability of survey launches and rendering it unsafe to fully investigate. The hydrographer recommends that prior survey soundings and features be retained in the areas of this bay not covered by the current survey⁶.

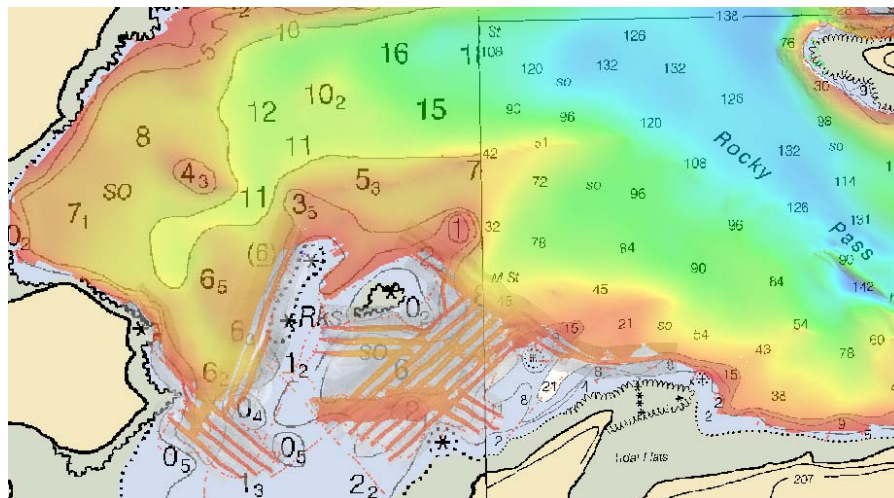


Figure 2. Limited MBES and SSS Coverage of the shallow bay SW of Rocky Pass.

B3. Data Reduction

Data reduction procedures for survey H11578 conform to those detailed in the *OPR-0180-RA-06 DAPR*.

B4. Data Representation

Many BASE surfaces were used in processing H11578. Final BASE surface resolutions and depth ranges were set in accordance with the Field Procedures Manual, with field sheets smaller than 25×10^6 nodes. The submission Field Sheet and BASE Surface structure are shown in Figures 3 and 4.

Side Scan Sonar data was split into two complete coverage mosaics to demonstrate areas covered by this technique (in addition to the required 100% MBES). These mosaics were created at 2m resolution and named "H11578_SSS_100" and "H11578_SSS_200".

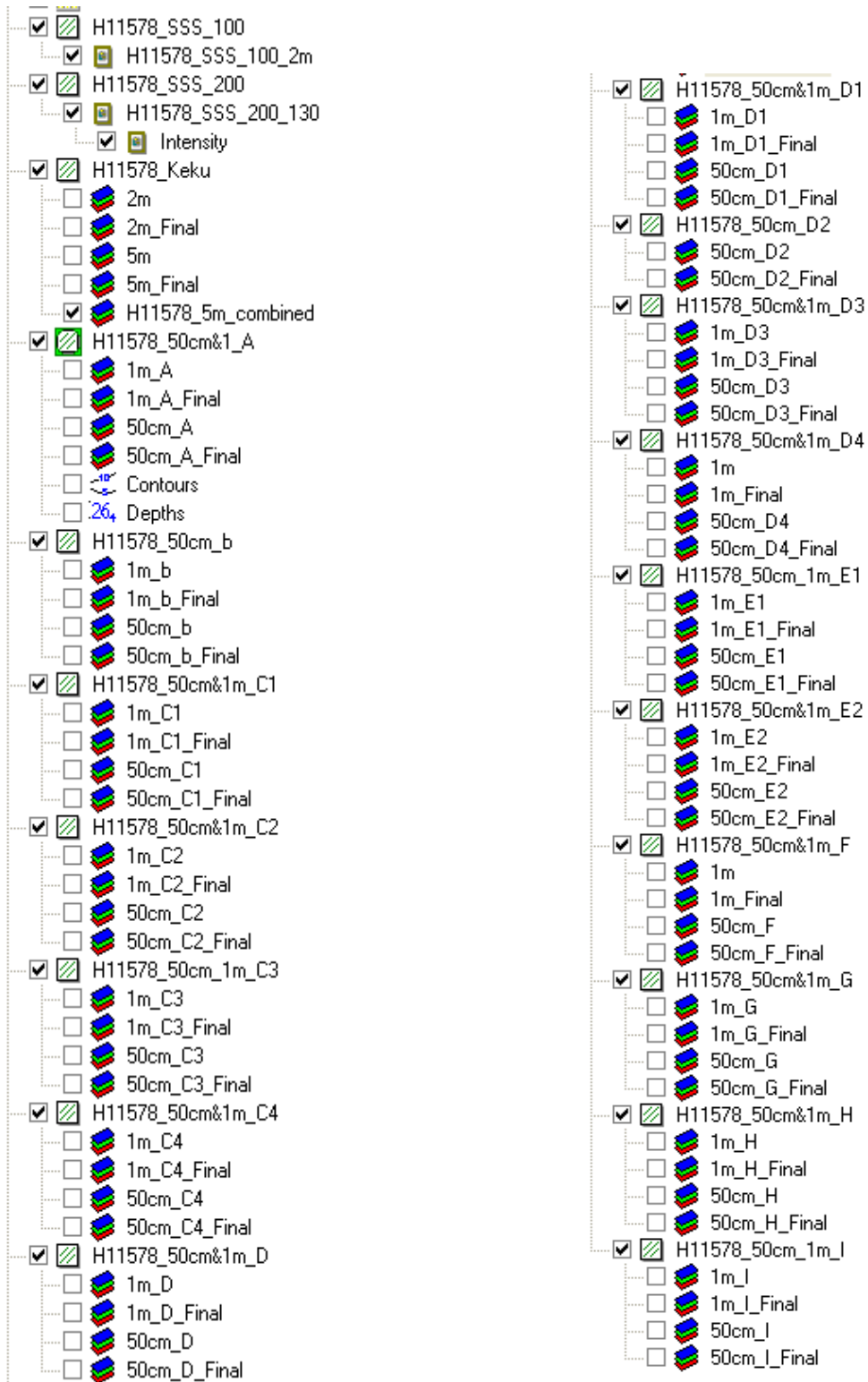


Figure 3: Field sheets and BASE surfaces submitted with H11578.

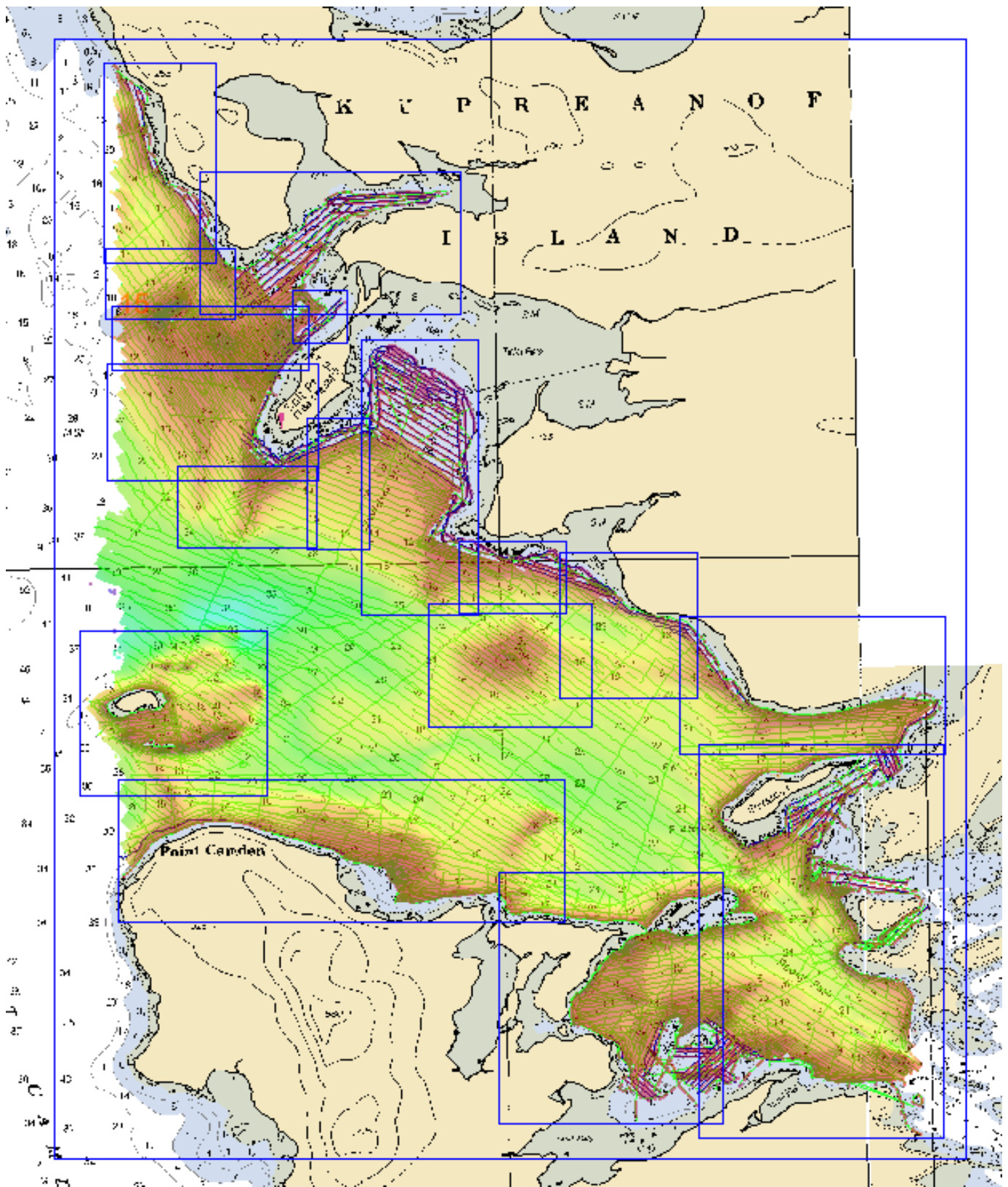


Figure 4: Layout of field sheet and BASE surfaces for H11578 overlaid on NOAA Charts 17368 and 17372.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11578 can be found in the *OPR-0180-RA-06 Horizontal and Vertical Control Report*⁷, 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	Operator	Distance	Priority
Level Island	295 kHz	USCG	30nm	Primary
Biorka Island	305 kHz	USCG	61nm	Backup

Table 3: Differential Corrector Sources for H11578.

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 Ketchikan, Tongass Narrows, AK (945-0460) served as control for datum determination and as the primary source for water level reducers for survey H11578.

RAINIER personnel installed Sutron 8210 “bubbler” tide gauges at the following subordinate stations in accordance with the Letter Instructions. These stations are described in detail in the *OPR-0180-RA-06 Horizontal and Vertical Control Report*.

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
The Summit	945-1349	Tertiary	April 17 th	June 8 th
Entrance Island	945-1438	Tertiary	April 17 th	June 8 th

Table 4: Tide Stations installed by RAINIER personnel for H11578

All data were reduced to MLLW using **final approved water levels** from station Ketchikan, Tongass Narrows, AK (945-0460) using the tide file 9450460.tid and final time and height correctors using the zone corrector H11578CORF.zdf.

The request for Final Approved Water Levels for H11758 was submitted to CO-OPS on June 11, 2006 and the Final Tide Note was received on June 13, 2006. This documentation is included in Appendix III⁸.

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.a. Survey Agreement with Chart

Survey H11578 was compared with the following charts:

Chart	Scale	Edition and Date	Latest Notice to Mariners Applied
17368	1:40,000	6 th Ed, August 1997	6/3/2006
17372	1:20,000	11 th Ed, Sep 2003	6/17/2006

Table 5: Charts compared with H11578

Survey soundings and charted depths were generally found to be in good agreement for the survey area, with differences of less than one fathom throughout. The only significant discrepancies occurred on the rocky shoals on the south side of the survey area, where soundings were generally 1 to 3 feet shoaler than charted depths. The most significant difference was found on the charted 3₂ fathom shoal immediately south of Pup Island, which was surveyed to 1₄ fathoms⁹.

D.1.b. Dangers to Navigation

No dangers to navigation (DTONs) were found in survey H11578¹⁰.

D.1.c. Other Features

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items for survey H11578¹¹.

Sidescan Contacts

Side scan sonar imagery was acquired in several bay areas and along much of the shoreline for survey H11578. Contacts identified were developed with multibeam as per the Field Procedures Manual, with the exception of those located inside the Navigational Area Limit Line (NALL).

Additional Items

No additional charted items were investigated and no other features were located on survey H11578.

D.2. Additional Results

D.2.a. Prior Survey Comparison

Formal prior survey comparison with H11578 was not performed. However, the hydrographer notes that portion of this survey covered by chart 17372 was found to be nearly equivalent to prior survey H09158.

D.2.b. Shoreline Verification

Shoreline Source

Vector photogrammetric projects AK-0504 was supplied by N/NGS3 in the form of cartographic feature file GC-10584 (CFF). Original positions of features from prior surveys were provided as a MapInfo table “OPR-O180-RA-06_PriorFeatures.tab”. Charted features that were not linked to prior source were provided as a MapInfo table “OPR-O180-RA-06-NotLinked.tab.” RAINIER personnel de-conflicted the CFF, Prior source, and charted features. The order of positional preference for features found in more than one source was CFF, Prior source, then charted. This de-confliction was done in Caris Notebook. RAINIER conducted limited shoreline verification of the de-conflicted source (H11578_deconflicted_combined.hob).

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) acquired during shoreline verification were recorded in HYPACK, logged on DP forms, and processed in Pydro. These indicate revisions to features and features not found on the verified shoreline. In addition, annotations describing shoreline were recorded on hard copy plots of digital shoreline. DP forms are included in the *Separates to be Included with Survey Data*¹².

All shoreline data is submitted in Caris Notebook .hob files. The session H11578_NTBK contains the following:

H11578_Original_Source.hob	All original source data.
H11578_Deconflicted_Source.hob	Source data following RAINIER de-confliction
H11578_Field_Verified.hob	De-conflicted source data as modified by field observations
H11578_Pydro_Updates.hob	DPs and other point features processed in Pydro. Includes new features, but cartographic symbols where height or extents of source features were observed have been removed from this layer.
H11578_Pydro_Disprovals.hob	Disprovals of charted or source features processed in Pydro. Includes GPs on CHD features inshore of the NALL that were disproved visually.

Table 5: HOB files included with notebook session

Source Shoreline Changes and New Features

For disprovals without a DP, a Chart GP was created in Pydro as a “placeholder”. The GP contains the disapproval information and recommendation.

Items for survey H11578 that require further discussion and are associated with a detached position, have been flagged “Report” in Pydro in H11578.pss. Investigation methods and recommendations are listed in the Remarks and Recommendation tabs. These features are included in the Survey Feature Report in Appendix II¹³. Items requiring more extensive description are discussed below.

Four new reefs have been delineated southwest of Rocky Pass. Each area had several CFF or charted rocks. It was determined visually in the field that these areas would be better represented as a reef. The hydrographer recommends deleting the CFF and charted rocks and delineating areas for the new reefs as depicted in the submitted .hob files and shown in Figure 5 below¹⁴.

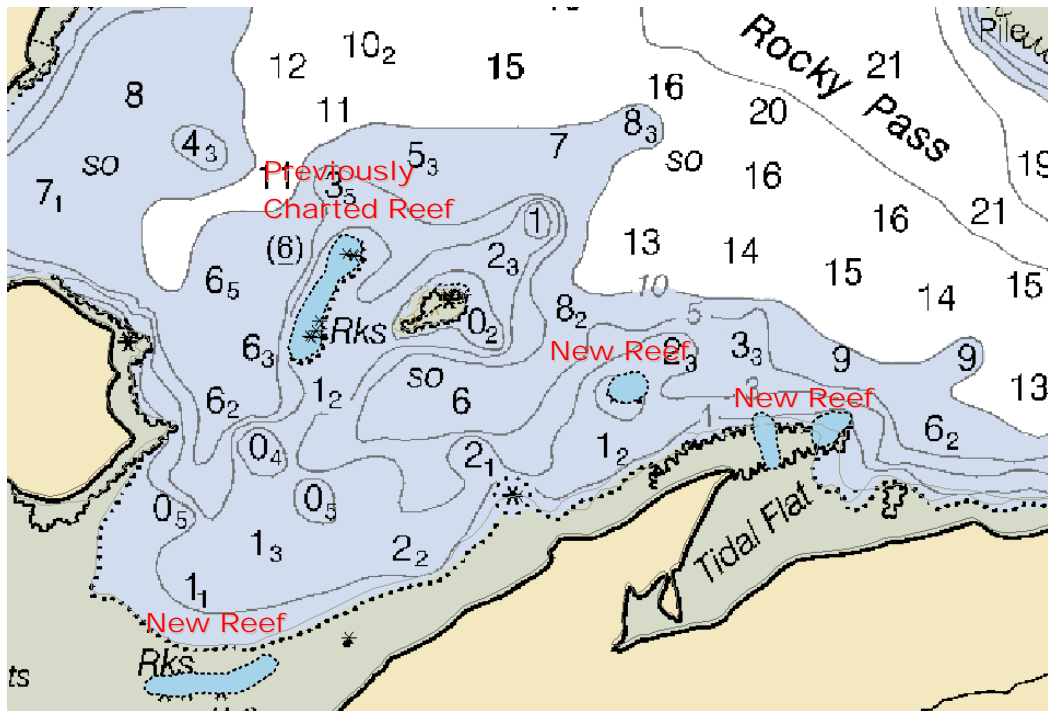


Figure 5: New reef locations southwest of Rocky Pass

The northeast end of Entrance Island was found to be a reef. This area was investigated in the field visually and a GP was taken to indicate the separation between the island and the reef. The hydrographer recommends delineating the new reef and editing the current island shoreline for charts 17368 and 17372¹⁵. See Figure 6.

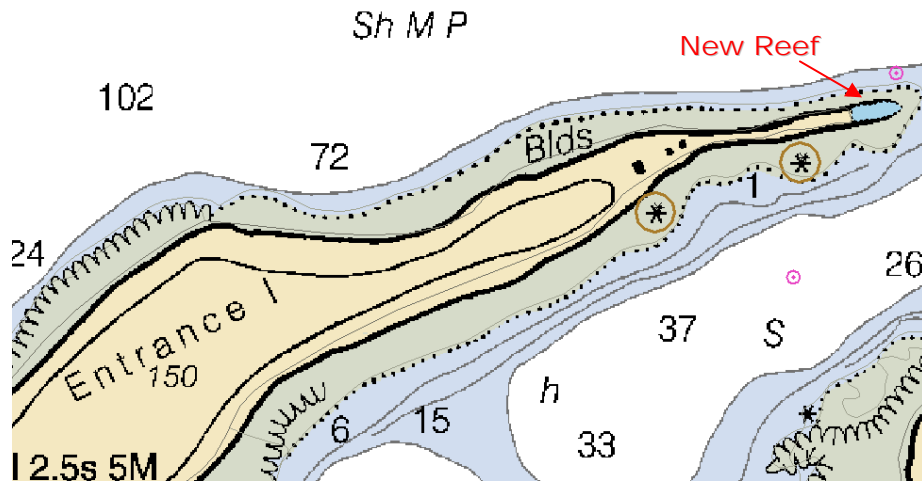


Figure 6: New reef on the northeast end of Entrance Island

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 described above¹⁶.

D.2.c. Aids to Navigation

Survey H11578 included two aids to navigation (ATONs). Each ATON was positioned using static GPS survey methods. Each of the ATONs was found to serve its intended purpose. No discrepancies between the charted and surveyed positions were found. Updated positions from the static survey were sent by email to MCD as prescribed in Section 5.2.3.3.5 of the Field Procedures Manual.

D.2.d. Overhead features

There are no overhead features in survey H11578¹⁷.

D.2.e. Submarine Cables and Pipelines

There are no submarine cables or pipelines charted within the limits of H11579, and none were detected by the survey¹⁸.

D.2.f. Ferry Routes

There are no ferry routes charted within the limits of survey H11579, and none were observed to be operating in the area.

D.2.g. Bottom Samples

Sixteen (16) bottom samples were conducted for survey H11578. The bottom sample locations were based on charted bottom types with spacing no greater than 2000 m or 1200 m and in designated anchorage areas. Descriptions of each sample are included in Appendix II.

Fourteen of the sixteen samples collected correlated well with charted bottom types, with only minor changes recommended. The remaining two samples were attempted in areas charted as soft or sand, but returned hard results (B.S. #3 in the cove SW of Rocky Pass, and B.S. #4 in the Bay E of Entrance Island). The hydrographer examined the positions of these samples, and determined that they were likely taken on adjacent rocky ledges or reefs. The hydrographer recommends retention of the charted bottom types at these locations¹⁹.

D.2.h Miscellaneous


RAINIER found fair anchorage in 21 ftm N of Entrance Island, near the range formed by Entrance Island Light and Rocky Pass beacon "43".

E. APPROVAL

Field operations for hydrographic survey H11578 were conducted under the direct supervision of the previous Commanding Officer, CDR Guy T. Noll, 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 (March 2003 edition), Field Procedures Manual (March 2005 edition), Standing and Letter Instructions, and all HSD Technical Directives issued through June 2006. 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 with the exception of deficiencies noted in the Descriptive Report. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P183-RA-06	April 9, 2007	N/CS34
Coast Pilot Report for OPR- P183-RA-06	April 9, 2007	N/CS26
Horizontal and Vertical Control Report for OPR-P183-RA-06	April 9, 2007	N/CS26

Approved and Forwarded:  2007.06.01
 11:56:58 -08'00'


Guy T. Noll
 Commander, NOAA
 Commanding Officer

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

Survey Sheet Manager:

Erin A. Campbell
 Physical Scientist, NOAA

Tides Officer:



Jamie S. Wasser
 Lieutenant (junior grade), NOAA

Jamie Wasser
 I have reviewed this document
 2007.06.01 22:03:15 Z

Horizontal Control Officer:



Laurel K. Jennings
I have reviewed this document
2007.06.01 19:42:24 Z

Laurel K. Jennings
Lieutenant (junior grade), NOAA

Chief Survey Technician:



James B Jacobson
I have reviewed this document
2007.06.01 18:38:12 Z

James B. Jacobson
Chief Survey Technician, NOAA Ship RAINIER

Field Operations Officer:



LT Benjamin K. Evans, NOAA
I have reviewed this document
2007.06.03 00:19:03 Z

Benjamin K. Evans
Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Standing Instructions for Hydrographic Surveys (April 2006), NOS Hydrographic Surveys Specifications and Deliverables (March 2003), OCS Field Procedures Manual for Hydrographic Surveying (December 2005), and all Hydrographic Surveys Technical Directives issued through June 2006. The Standing Instructions are filed with the Project Records

² Filed with Project Records

³ Concur

⁴ Filed with Project Records

⁵ Do not concur. Five lines surveyed by the ELAC system on DN116 did not meet IHO Order One standards and were removed from the BASE surface submitted for compilation.

⁶ Concur

⁷ Filed with the Project Records

⁸ Final Tide Note is attached to this report

⁹ Chart comparisons were performed in the Office. Several discrepancies were found that were not addressed by the field and are as follows: 1) A shoaling trend was noted approximately 500 meters to the Southeast of Pup Island. Surveyed depths were up to 3 fathoms (5.5 m) deeper than the charted (17368) depths. In particular, a new shoal with a least depth of 7.3 fm (13.4 m) located at 56/49/11 N, 133/52/24 W was surveyed in the vicinity of a charted (17368) 10.2-fm depth. It is recommended that the charted 5 and 10 fathom contours be updated to better represent the true position of the shoal. 2) A submerged ledge located approximately 1 nm Southeast of Pup Island with a least depth of 12.3 fm (22.5 m) was surveyed between a charted (17368) 14-fm depth and a 20-fm contour. 3) A submerged feature was found west of Salt Point with a least depth of 0.5 fm (0.9 m) in the vicinity of a charted (17368) 2 fm sounding (56/50/60 N, 133/52/02.5 W). 4) Just north of Entrance Island, a submerged feature with a least depth of 13.3 fm (24.4. m) was surveyed between charted (17368) depths of 15 and 16 fms. 5) A 13-ft (2 fm, 4 m) sounding located at 56/48/13 N, 133/47/43 W was surveyed over a charted (17372) 25 foot (4 fm, 7.6 m) depth. The new shoal was located near the Northern Entrance to Rocky Pass.

¹⁰ Do not concur. Two DTONs were found and submitted during review. See attached DTON Report.

¹¹ Concur

¹² Filed with Hydrographic Records

¹³ See attached Features Report

¹⁴ Chart reefs as depicted in the HCell

¹⁵ Chart new reef as depicted in HCell

¹⁶ Concur

¹⁷ Concur

¹⁸ Concur

¹⁹ Bottom samples have been included in conjunction with office delineated rocky seabed areas. Conflicting bottom samples were removed and charted bottom samples were retained where necessary.

Dangers to Navigation

Registry Number: H11578
State: Alaska
Locality: Keku Strait
Sub-locality: Rocky Pass to Dakaneek Bay
Project Number: OPR-O180-RA-06
Survey Dates: 04/25/2006 - 05/01/2006

Charts Affected

Number	Version	Date	Scale
17372	11th Ed.	09/01/2003	1:20000
17360	34th Ed.	03/01/2006	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	5.57 m	56° 47' 19.848" N	133° 46' 14.839" W	---
1.2	Shoal	11.22 m	56° 47' 27.247" N	133° 46' 29.366" W	---

1 - Dangers to Navigation

1.1) Profile/Beam - 1210/103 from h11578 / 1016_reson8125_hvf / 2006-115 / 967_1953

DANGER TO NAVIGATION

Survey Summary

Survey Position: 56° 47' 19.848" N, 133° 46' 14.839" W
Least Depth: 5.57 m
Timestamp: 2006-115.19:54:18.943 (04/25/2006)
Survey Line: h11578 / 1016_reson8125_hvf / 2006-115 / 967_1953
Profile/Beam: 1210/103
Charts Affected: 17372_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a least depth of 18.3 ft (5.6 m) was located in the vicinity of a chd (17373) depth of 36 ft (11 m). The surveyed sounding is located at the southern entrance to Rocky Pass.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1016_reson8125_hvf/2006-115/967_1953	1210/103	0.00	000.0	Primary

Hydrographer Recommendations

Update charts with surveyed least depth.

Cartographically-Rounded Depth (Affected Charts):

18ft (17372_1)

3fm (17360_1, 16016_1, 530_1)

3fm 0ft (531_1)

5.5m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Office Notes

DTON noted on most up to date chart and applied to HCell

Feature Images

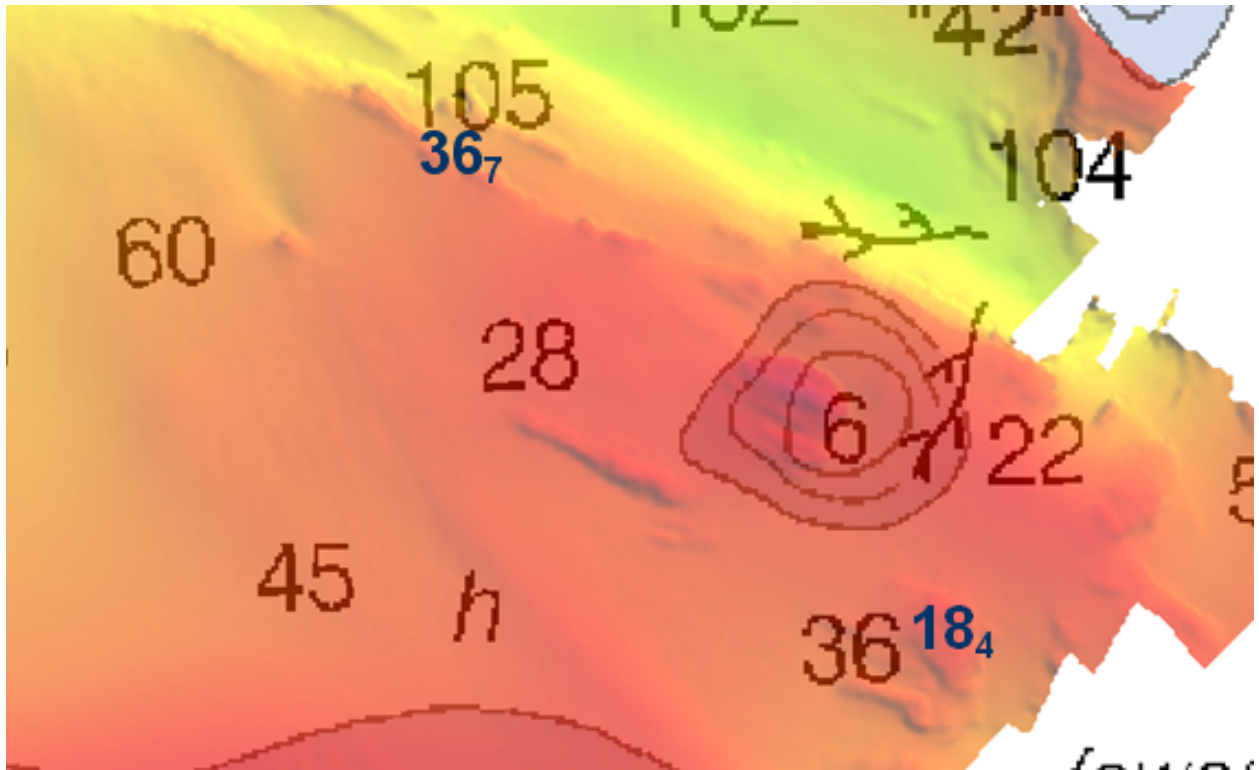


Figure 1.1.1

1.2) Profile/Beam - 642/59 from h11578 / 1016_reson8125_hvf / 2006-121 / 919_1844

DANGER TO NAVIGATION

Survey Summary

Survey Position: 56° 47' 27.247" N, 133° 46' 29.366" W
Least Depth: 11.22 m
Timestamp: 2006-121.18:46:50.329 (05/01/2006)
Survey Line: h11578 / 1016_reson8125_hvf / 2006-121 / 919_1844
Profile/Beam: 642/59
Charts Affected: 17372_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

A new shoal with a least depth of 36.7 ft (11.2 m) was surveyed in the vicinity of a chd (17372) depth of 105 ft (32 m). The surveyed sounding is located at the southern entrance to Rocky Pass.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1016_reson8125_hvf/2006-121/919_1844	642/59	0.00	000.0	Primary

Hydrographer Recommendations

Update charts with surveyed least depth.

Cartographically-Rounded Depth (Affected Charts):

37ft (17372_1)

6fm (17360_1, 16016_1, 530_1)

6fm 1ft (531_1)

11.2m (500_1, 50_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Office Notes

DTON noted on current chart. Shoaler sounding in vicinity is applied to HCell.

H11578 Survey Features Report

Registry Number: H11578
State: AK
Locality: Keku Strait
Sub-locality: Rocky Pass to Dakaneek Bay
Project Number: OPR-0180-RA-06
Survey Dates: 04/28/2006 - 12/01/2006

Charts Affected

Number	Version	Date	Scale
17372	11th Ed.	09/01/2003	1:20000
17368	6th Ed.	08/09/1997	1:40000
17360	34th Ed.	03/01/2006	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	-2.70 m	56° 51' 18.714" N	133° 51' 57.234" W	---
1.2	Sounding	-1.49 m	56° 49' 05.580" N	133° 53' 04.308" W	---
1.3	Sounding	-2.07 m	56° 49' 06.624" N	133° 53' 14.970" W	---
1.4	Sounding	0.59 m	56° 48' 19.891" N	133° 51' 04.630" W	---
1.5	Sounding	-1.07 m	56° 48' 14.880" N	133° 49' 59.790" W	---
1.6	Sounding	-1.04 m	56° 47' 36.843" N	133° 48' 25.387" W	---
1.7	Sounding	-0.36 m	56° 47' 30.420" N	133° 48' 31.920" W	---
1.8	Sounding	-1.59 m	56° 48' 36.648" N	133° 46' 53.130" W	---
1.9	GP	[None]	56° 48' 39.567" N	133° 47' 58.187" W	---
1.10	GP	[None]	56° 47' 15.581" N	133° 47' 04.913" W	---
1.11	GP	[None]	56° 47' 22.114" N	133° 47' 11.933" W	---

1.12	GP	[None]	56° 47' 20.374" N	133° 47' 23.808" W	---
1.13	GP	[None]	56° 47' 00.572" N	133° 48' 42.783" W	---
1.14	GP	[None]	56° 47' 24.675" N	133° 47' 44.377" W	---
2.1	Sounding	0.88 m	56° 50' 59.835" N	133° 52' 02.605" W	---
2.2	Sounding	0.73 m	56° 51' 48.472" N	133° 51' 17.513" W	---
2.3	Sounding	2.11 m	56° 49' 04.320" N	133° 52' 58.602" W	---
2.4	Sounding	0.19 m	56° 47' 37.562" N	133° 48' 21.518" W	---
2.5	Sounding	0.05 m	56° 48' 49.488" N	133° 46' 26.340" W	---
2.6	SSS	[None]	56° 51' 00.370" N	133° 50' 50.055" W	---

1 - Charted Features

1.1) Profile/Beam - 3/1 from h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a

Survey Summary

Survey Position: 56° 51' 18.714" N, 133° 51' 57.234" W
Least Depth: -2.70 m
Timestamp: 2006-118.17:11:58.000 (04/28/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a
Profile/Beam: 3/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

vfd cff rk height

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-118/04282006_a	3/1	0.00	000.0	Primary

Hydrographer Recommendations

Cht rk ht as observed

Cartographically-Rounded Depth (Affected Charts):

-1 ½fm (17360_1, 16016_1, 530_1)
 -1fm 3ft (17368_1, 531_1)
 -2.7m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock height

Feature Images



Figure 1.1.1

1.2) Profile/Beam - 4/1 from h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a

Survey Summary

Survey Position: 56° 49' 05.580" N, 133° 53' 04.308" W
Least Depth: -1.49 m
Timestamp: 2006-118.18:12:32.000 (04/28/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a
Profile/Beam: 4/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for Height on CFF RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-118/04282006_a	4/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of CFF RK.

Cartographically-Rounded Depth (Affected Charts):

0 ¾fm (17360_1, 16016_1, 530_1)
 0fm 5ft (17368_1, 531_1)
 -1.5m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock height

Feature Images



Figure 1.2.1

1.3) Profile/Beam - 5/1 from h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a

Survey Summary

Survey Position: 56° 49' 06.624" N, 133° 53' 14.970" W
Least Depth: -2.07 m
Timestamp: 2006-118.18:16:49.000 (04/28/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a
Profile/Beam: 5/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for Height on CFF RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-118/04282006_a	5/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of CFF RK.

Cartographically-Rounded Depth (Affected Charts):

- 1fm (17360_1, 16016_1, 530_1)
- 1fm 1ft (17368_1, 531_1)
- 2.1m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock height

Feature Images



Figure 1.3.1

1.4) Profile/Beam - 2/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 48' 19.891" N, 133° 51' 04.630" W
Least Depth: 0.59 m
Timestamp: 2006-119.16:19:27.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 2/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for Height on CHD RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of CHD RK.

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17360_1, 16016_1, 530_1)

0fm 2ft (17368_1, 531_1)

.6m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock height

Feature Images

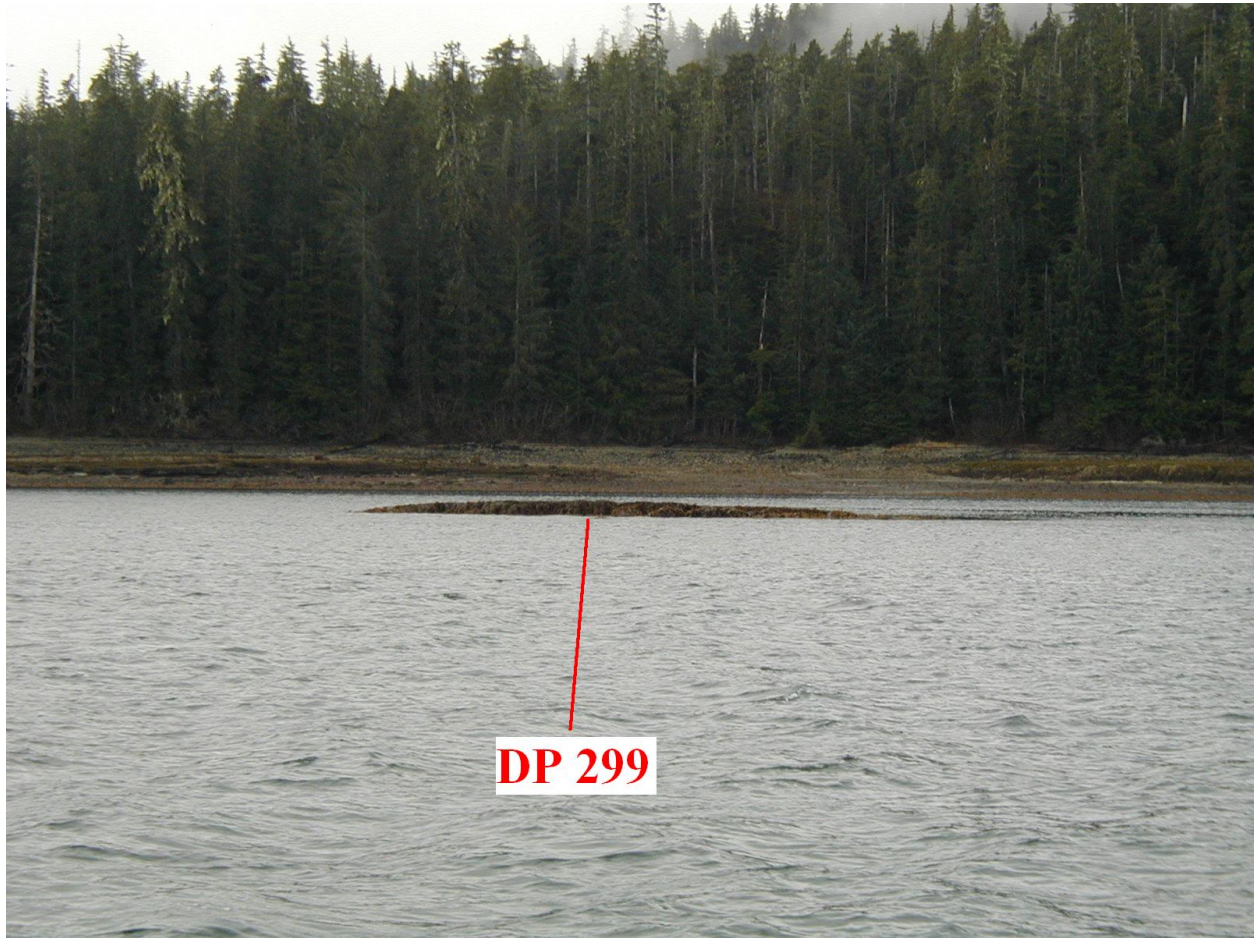


Figure 1.4.1

1.5) Profile/Beam - 3/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 48' 14.880" N, 133° 49' 59.790" W
Least Depth: -1.07 m
Timestamp: 2006-119.16:29:47.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 3/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for Height on CFF RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	3/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of CFF RK

Cartographically-Rounded Depth (Affected Charts):

0 ½fm (17360_1, 16016_1, 530_1)

0fm 3ft (17368_1, 531_1)

-1.1m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock height

Feature Images

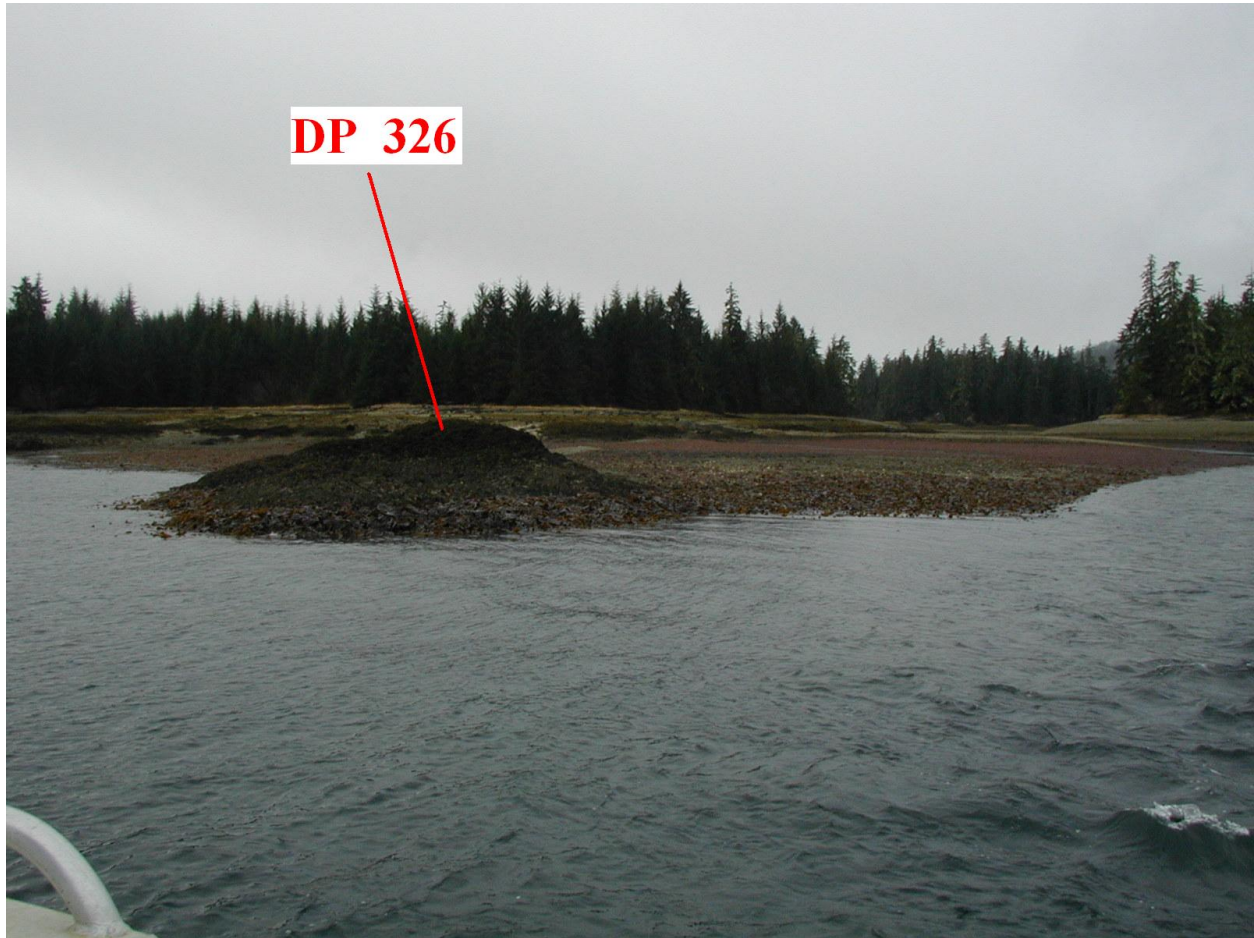


Figure 1.5.1

1.6) Profile/Beam - 5/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 47' 36.843" N, 133° 48' 25.387" W
Least Depth: -1.04 m
Timestamp: 2006-119.17:06:48.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 5/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

NW ext chd shoal. DP also holds height of PRIOR RK.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	5/1	0.00	000.0	Primary
h11578/1015_k5k_200_hvf/2006-129/sonar_data060509203600	0003	17.38	291.3	Secondary

Hydrographer Recommendations

Retain as chd

Cartographically-Rounded Depth (Affected Charts):

0 ½fm (17360_1, 16016_1, 530_1)

0fm 3ft (17368_1, 531_1)

-1.1m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart new shoal

Feature Images

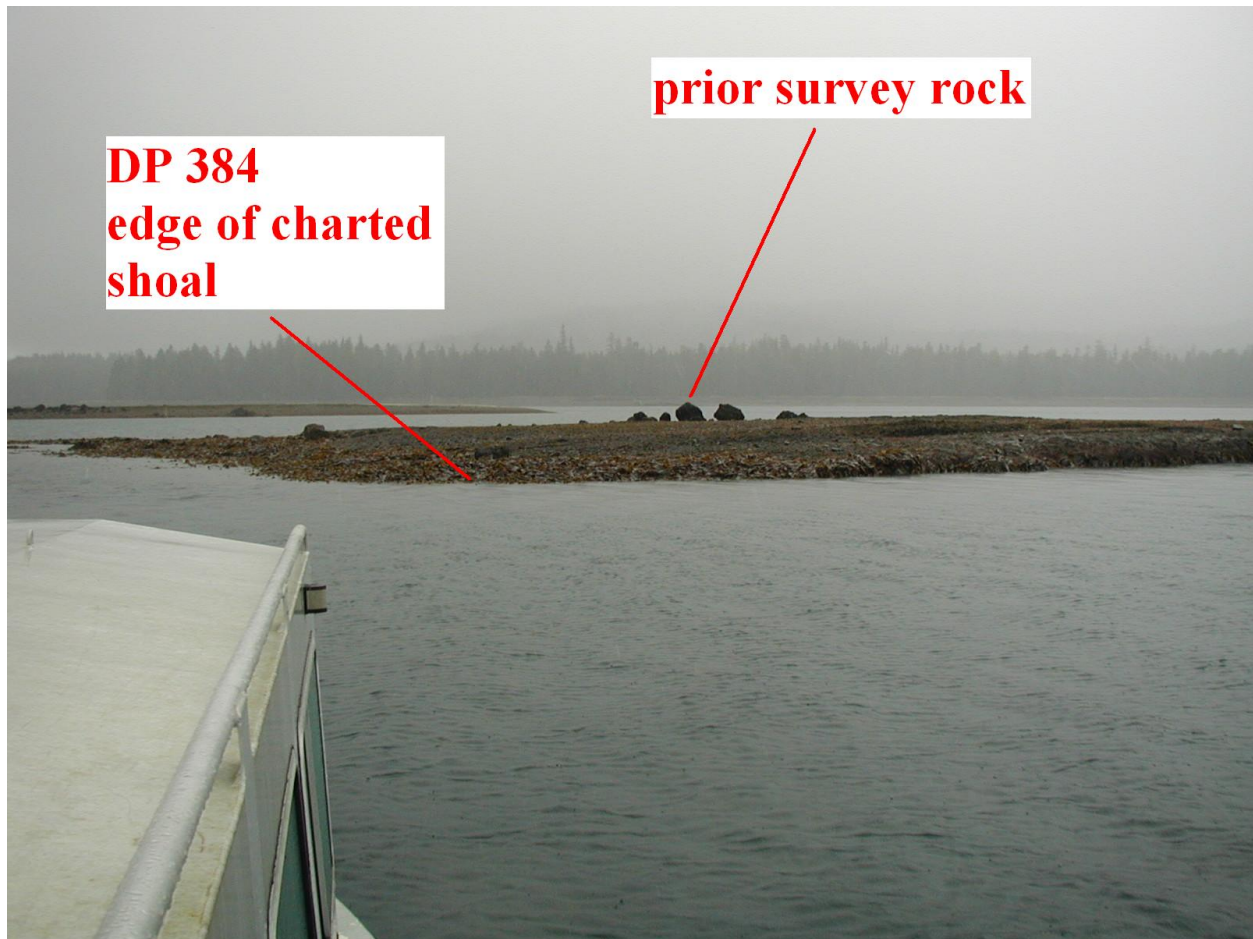


Figure 1.6.1

1.7) Profile/Beam - 6/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 47' 30.420" N, 133° 48' 31.920" W
Least Depth: -0.36 m
Timestamp: 2006-119.17:14:56.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 6/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for Height on CFF and 2 PRIOR RKs. RKS are same height.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	6/1	0.00	000.0	Primary
h11578/1015_k5k_100_hvf/2006-129/sonar_data060509203900	0001	8.15	227.2	Secondary

Hydrographer Recommendations

Modify Height of CFF and PRIOR source RK

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17360_1, 16016_1, 530_1)

0fm 1ft (17368_1, 531_1)

-.4m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rk heights

Feature Images



Figure 1.7.1

1.8) Profile/Beam - 10/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 48' 36.648" N, 133° 46' 53.130" W
Least Depth: -1.59 m
Timestamp: 2006-119.18:41:36.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 10/1
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

2 CFF rks are HPs chd reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	10/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of REEF

Cartographically-Rounded Depth (Affected Charts):

-5ft (17372_1)

0 ¾fm (17360_1, 16016_1, 530_1)

0fm 5ft (17368_1, 531_1)

-1.6m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart rock heights

Feature Images



Figure 1.8.1

1.9) GP No. - 5 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 48' 39.567" N, 133° 47' 58.187" W
Least Depth: [None]
Timestamp: 2006-335.11:25:21 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 5
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CHD (17368) MLW deleted

Feature Correlation

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

Hydrographer Recommendations

delete CHD MLW

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart extents of GC ledge

1.10) GP No. - 10 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 15.581" N, 133° 47' 04.913" W
Least Depth: [None]
Timestamp: 2006-335.12:16:30 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 10
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CFF rk not seen

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	10	0.00	000.0	Primary

Hydrographer Recommendations

delete CFF rk

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Retain CFF rock

1.11) GP No. - 11 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 22.114" N, 133° 47' 11.933" W
Least Depth: [None]
Timestamp: 2006-335.15:11:26 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 11
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CFF and CHD rks are reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_singlebeam_hvf/2006-118/dp_1101_dn118	6/1	0.00	000.0	Primary
ChartGPs - Digitized	11	15.46	197.8	Secondary (grouped)

Hydrographer Recommendations

Delete rks, add reef

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart reef

1.12) GP No. - 12 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 20.374" N, 133° 47' 23.808" W
Least Depth: [None]
Timestamp: 2006-335.15:12:33 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 12
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CFF and CHD rks are reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_singlebeam_hvf/2006-118/dp_1101_dn118	5/1	0.00	000.0	Primary
ChartGPs - Digitized	12	10.35	035.8	Secondary (grouped)

Hydrographer Recommendations

Delete rks, add reef

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart reef

1.13) GP No. - 13 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 00.572" N, 133° 48' 42.783" W
Least Depth: [None]
Timestamp: 2006-335.15:19:38 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 13
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Rks are new reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	13	0.00	000.0	Primary

Hydrographer Recommendations

Delete rks, add reef

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart reef

1.14) GP No. - 14 from ChartGPs - Digitized

Survey Summary

Survey Position: 56° 47' 24.675" N, 133° 47' 44.377" W
Least Depth: [None]
Timestamp: 2006-335.15:28:33 (12/01/2006)
GP Dataset: ChartGPs - Digitized
GP No.: 14
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CFF/CHD rks are extent of new reef.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_singlebeam_hvf/2006-118/dp_1101_dn118	4/1	0.00	000.0	Primary
ChartGPs - Digitized	14	8.99	179.1	Secondary (grouped)
h11578/1015_k5k_100_hvf/2006-129/sonar_data060509195200	0002	46.24	155.1	Secondary (grouped)

Hydrographer Recommendations

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Chart reef

2 - New Features

2.1) Profile/Beam - 1/1 from h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a

Survey Summary

Survey Position: 56° 50' 59.835" N, 133° 52' 02.605" W
Least Depth: 0.88 m
Timestamp: 2006-118.16:27:05.000 (04/28/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a
Profile/Beam: 1/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

new submerged rk

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-118/04282006_a	1/1	0.00	000.0	Primary
h11578/1015_k5k_100_hvf/2006-116/sonar_data060426190900	0003	12.72	007.0	Secondary

Hydrographer Recommendations

Add rk to cht (17372, 17368)

Cartographically-Rounded Depth (Affected Charts):

0 ½fm (17360_1, 16016_1, 530_1)

0fm 3ft (17368_1, 531_1)

.9m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: SORDAT - 20060608
 SORIND - US,US,graph,H11578
 VALSOU - 0.883 m
 WATLEV - 5:awash

Office Notes

Chart rock

2.2) Profile/Beam - 2/1 from h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a

Survey Summary

Survey Position: 56° 51' 48.472" N, 133° 51' 17.513" W
Least Depth: 0.73 m
Timestamp: 2006-118.16:49:20.000 (04/28/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-118 / 04282006_a
Profile/Beam: 2/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Small Floating Oyster Pen. Feature is charted 130m to the east of this position.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-118/04282006_a	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Removed CHD "Platform", Chat Marine Cultural Feature at this position.

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17360_1, 16016_1, 530_1)

0fm 2ft (17368_1, 531_1)

.7m (500_1, 50_1)

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)

Office Notes

Modify position of Fish Pen

Feature Images



Figure 2.2.1

2.3) Profile/Beam - 1/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 49' 04.320" N, 133° 52' 58.602" W
Least Depth: 2.11 m
Timestamp: 2006-119.15:48:23.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 1/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

New Submerged RK

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	1/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart new RK

Cartographically-Rounded Depth (Affected Charts):

1fm (17360_1, 16016_1, 530_1)

1fm 1ft (17368_1, 531_1)

2.1m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20060608
 SORIND - US,US,graph,H11578
 TECSOU - 5:found by lead-line
 VALSOU - 2.106 m
 WATLEV - 3:always under water/submerged

Office Notes

Chart rock

2.4) Profile/Beam - 4/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 47' 37.562" N, 133° 48' 21.518" W
Least Depth: 0.19 m
Timestamp: 2006-119.17:00:11.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 4/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

new rk

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	4/1	0.00	000.0	Primary

Hydrographer Recommendations

Add rk to cht (17372, 17368)

Cartographically-Rounded Depth (Affected Charts):

0fm (17360_1, 16016_1, 530_1)

0fm 0ft (17368_1, 531_1)

.2m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: SORDAT - 20060608
 SORIND - US,US,graph,H11578
 VALSOU - 0.187 m
 WATLEV - 5:awash

Office Notes

Chart rock

Feature Images



Figure 2.4.1

2.5) Profile/Beam - 11/1 from h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119

Survey Summary

Survey Position: 56° 48' 49.488" N, 133° 46' 26.340" W
Least Depth: 0.05 m
Timestamp: 2006-119.18:50:05.000 (04/29/2006)
DP Dataset: h11578 / 1103_nonechosounder_dp / 2006-119 / dp-1103-119
Profile/Beam: 11/1
Charts Affected: 17372_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

new submmerged rk

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1103_nonechosounder_dp/2006-119/dp-1103-119	11/1	0.00	000.0	Primary

Hydrographer Recommendations

Add rk to cht (17372, 17368)

Cartographically-Rounded Depth (Affected Charts):

0ft (17372_1)

0fm (17360_1, 16016_1, 530_1)

0fm 0ft (531_1)

.0m (500_1, 50_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: SORDAT - 20060608
 SORIND - US,US,graph,H11578
 VALSOU - 0.054 m
 WATLEV - 3:always under water/submerged

Office Notes

Chart Rock

2.6) Contact/Point - 0001/1 from h11578 / 1015_k5k_200_hvf / 2006-119 / sonar_data060429233700

Survey Summary

Survey Position: 56° 51' 00.370" N, 133° 50' 50.055" W
Least Depth: [None]
Timestamp: 2006-120.05:46:17 (04/30/2006)
Survey Line: h11578 / 1015_k5k_200_hvf / 2006-119 / sonar_data060429233700
Contact/Point: 0001/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Small isolated rock. Many small rocks in vicinity. Found with 200% side scan coverage and investigated with SWMB.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1015_k5k_200_hvf/2006-119/sonar_data060429233700	0001	0.00	000.0	Primary
h11578/1015_k5k_100_hvf/2006-116/sonar_data060426200900	0001	28.96	184.4	Secondary

Hydrographer Recommendations

Add new rk to chart.

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: WATLEV - 3:always under water/submerged

Office Notes

[None]

Additional Features

Registry Number: H11578
State: Alaska
Locality: Keku Strait
Sub-locality: Rocky Pass to Dakaneek Bay
Project Number: OPR-0180-RA-06
Survey Date: 04/28/2006

Charts Affected

Number	Version	Date	Scale
17372	11th Ed.	09/01/2003	1:20000
17368	7th Ed.	08/01/2006	1:40000
17360	34th Ed.	03/01/2006	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	23rd Ed.	01/01/2006	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	31st Ed.	06/01/2005	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	0.46 m	56° 48' 57.733" N	133° 46' 35.045" W	---
1.2	Sounding	-3.58 m	56° 47' 29.525" N	133° 48' 55.764" W	---
1.3	Sounding	0.62 m	56° 47' 19.748" N	133° 48' 36.980" W	---
1.4	Sounding	-0.33 m	56° 47' 25.885" N	133° 47' 37.347" W	---
1.5	Sounding	-2.75 m	56° 47' 23.385" N	133° 47' 10.227" W	---
1.6	Sounding	-1.30 m	56° 47' 21.724" N	133° 47' 03.089" W	---
1.7	Sounding	-0.93 m	56° 47' 08.829" N	133° 46' 09.745" W	---
1.8	Sounding	-2.13 m	56° 47' 34.827" N	133° 48' 10.740" W	---

1.1) Profile/Beam - 1/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 48' 57.733" N, 133° 46' 35.045" W
Least Depth: 0.46 m
Timestamp: 2006-118.15:45:33.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 1/1
Charts Affected: 17372_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Extent of reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	1/1	0.00	000.0	Primary

Hydrographer Recommendations

Add new REEF.

Cartographically-Rounded Depth (Affected Charts):

1ft (17372_1)

0 ¼fm (17360_1, 16016_1, 530_1)

0fm 1ft (531_1)

.4m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart reef

Feature Images

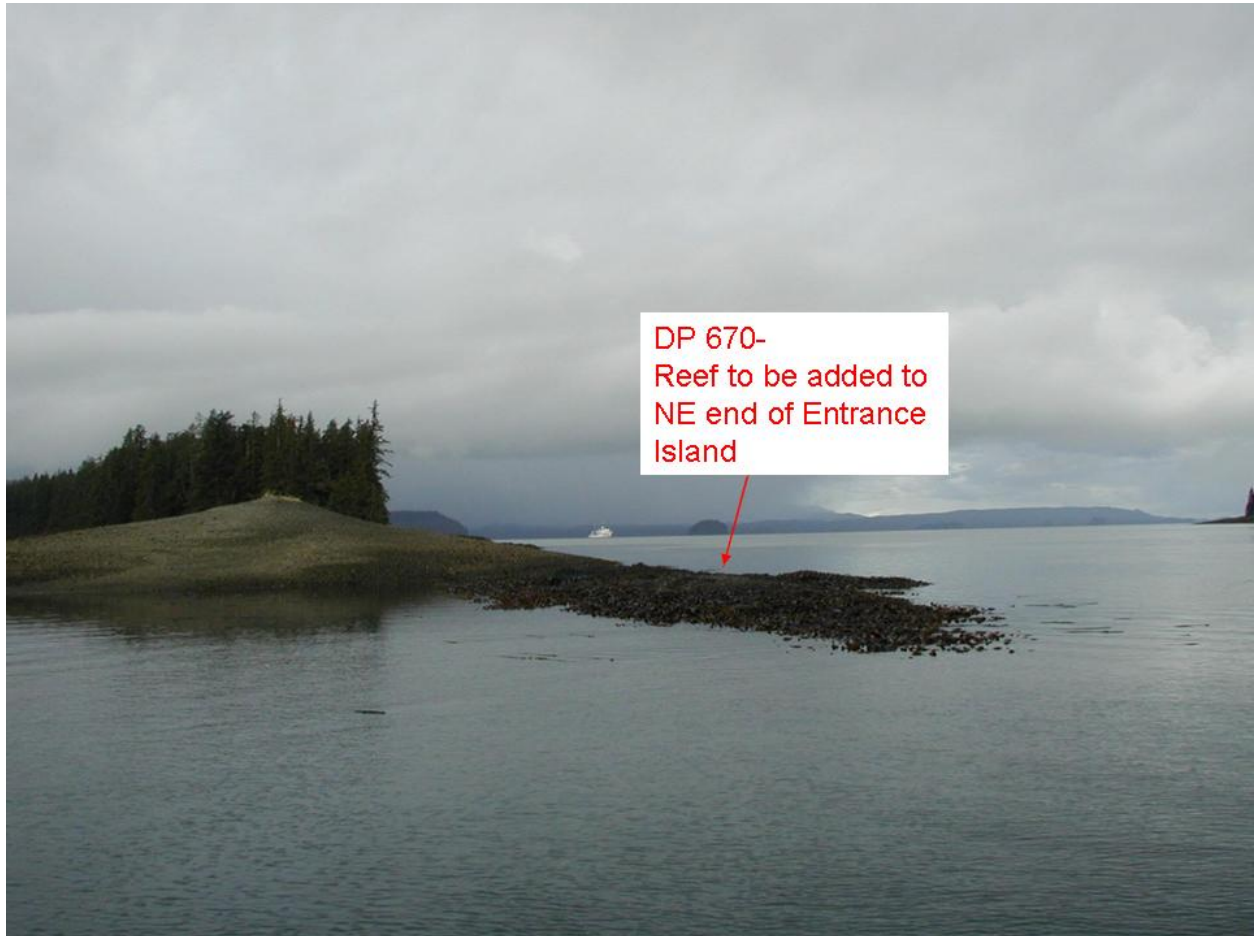


Figure 1.1.1

1.2) Profile/Beam - 2/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 29.525" N, 133° 48' 55.764" W
Least Depth: -3.58 m
Timestamp: 2006-118.17:20:18.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 2/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

CFF RK IS DP for Height

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify Height of CFF RK

Cartographically-Rounded Depth (Affected Charts):

0fm (17360_1, 16016_1, 530_1)

-1fm 5ft (17368_1, 531_1)

-3.6m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock height

Feature Images



Figure 1.2.1

1.3) Profile/Beam - 3/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 19.748" N, 133° 48' 36.980" W
Least Depth: 0.62 m
Timestamp: 2006-118.17:39:57.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 3/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

New Rock

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	3/1	0.00	000.0	Primary

Hydrographer Recommendations

Add rk to cht (17372, 17368)

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (17360_1, 16016_1, 530_1)

0fm 2ft (17368_1, 531_1)

.6m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock

Feature Images



Figure 1.3.1

1.4) Profile/Beam - 4/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 25.885" N, 133° 47' 37.347" W
Least Depth: -0.33 m
Timestamp: 2006-118.17:57:28.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 4/1
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for height. CHD and CFF RKs are HP Reef.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	4/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart Reef. Use this height to update height of CFF RK.

Cartographically-Rounded Depth (Affected Charts):

-1ft (17372_1)
 0fm (17360_1, 16016_1, 530_1)
 0fm 1ft (17368_1, 531_1)
 -.4m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock as hp of reef

1.5) Profile/Beam - 5/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 23.385" N, 133° 47' 10.227" W
Least Depth: -2.75 m
Timestamp: 2006-118.18:01:22.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 5/1
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for height reef

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	5/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify extents of REEF to visual observations, Modify height of CFF RK to hold height.

Cartographically-Rounded Depth (Affected Charts):

-9ft (17372_1)
 -1 ½fm (17360_1, 16016_1, 530_1)
 -1fm 3ft (17368_1, 531_1)
 -2.8m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Modify ledge to form two reefs

1.6) Profile/Beam - 6/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 21.724" N, 133° 47' 03.089" W
Least Depth: -1.30 m
Timestamp: 2006-118.18:03:43.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 6/1
Charts Affected: 17372_1, 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for height

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	6/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify extents of CHD LDGE. Use this height to modify height of CFF RK on REEF.

Cartographically-Rounded Depth (Affected Charts):

-5ft (17372_1)
 0 ¾fm (17360_1, 16016_1, 530_1)
 0fm 4ft (17368_1, 531_1)
 -1.3m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock as hp of reef

1.7) Profile/Beam - 7/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 08.829" N, 133° 46' 09.745" W
Least Depth: -0.93 m
Timestamp: 2006-118.18:27:54.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 7/1
Charts Affected: 17372_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for height

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	7/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock height as observed

Cartographically-Rounded Depth (Affected Charts):

-3ft (17372_1)

0 ½fm (17360_1, 16016_1, 530_1)

0fm 3ft (531_1)

-1.0m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock as height of reef

1.8) Profile/Beam - 8/1 from h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118

Survey Summary

Survey Position: 56° 47' 34.827" N, 133° 48' 10.740" W
Least Depth: -2.13 m
Timestamp: 2006-118.18:44:04.000 (04/28/2006)
DP Dataset: h11578 / 1101_nonechosounder_dp / 2006-118 / dp_1101_dn118
Profile/Beam: 8/1
Charts Affected: 17368_1, 17360_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

DP for height. CFF RK is HP REEF.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11578/1101_nonechosounder_dp/2006-118/dp_1101_dn118	8/1	0.00	000.0	Primary

Hydrographer Recommendations

Modify height of CFF RK.

Cartographically-Rounded Depth (Affected Charts):

-1fm (17360_1, 16016_1, 530_1)
 -1fm 1ft (17368_1, 531_1)
 -2.1m (500_1, 50_1)

S-57 Data

[None]

Office Notes

Chart rock height



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 22, 2006

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0180-RA-2006
HYDROGRAPHIC SHEET: H11578

LOCALITY: Rocky Pass to Dakaneek Bay, Keku Strait, AK
TIME PERIOD: April 17 - June 8, 2006

TIDE STATION USED: 945-1438 Entrance Island, AK
Lat. 56° 48.7'N Long. 133° 47.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.177 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SA403, SA404, SA405 and SA406

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).

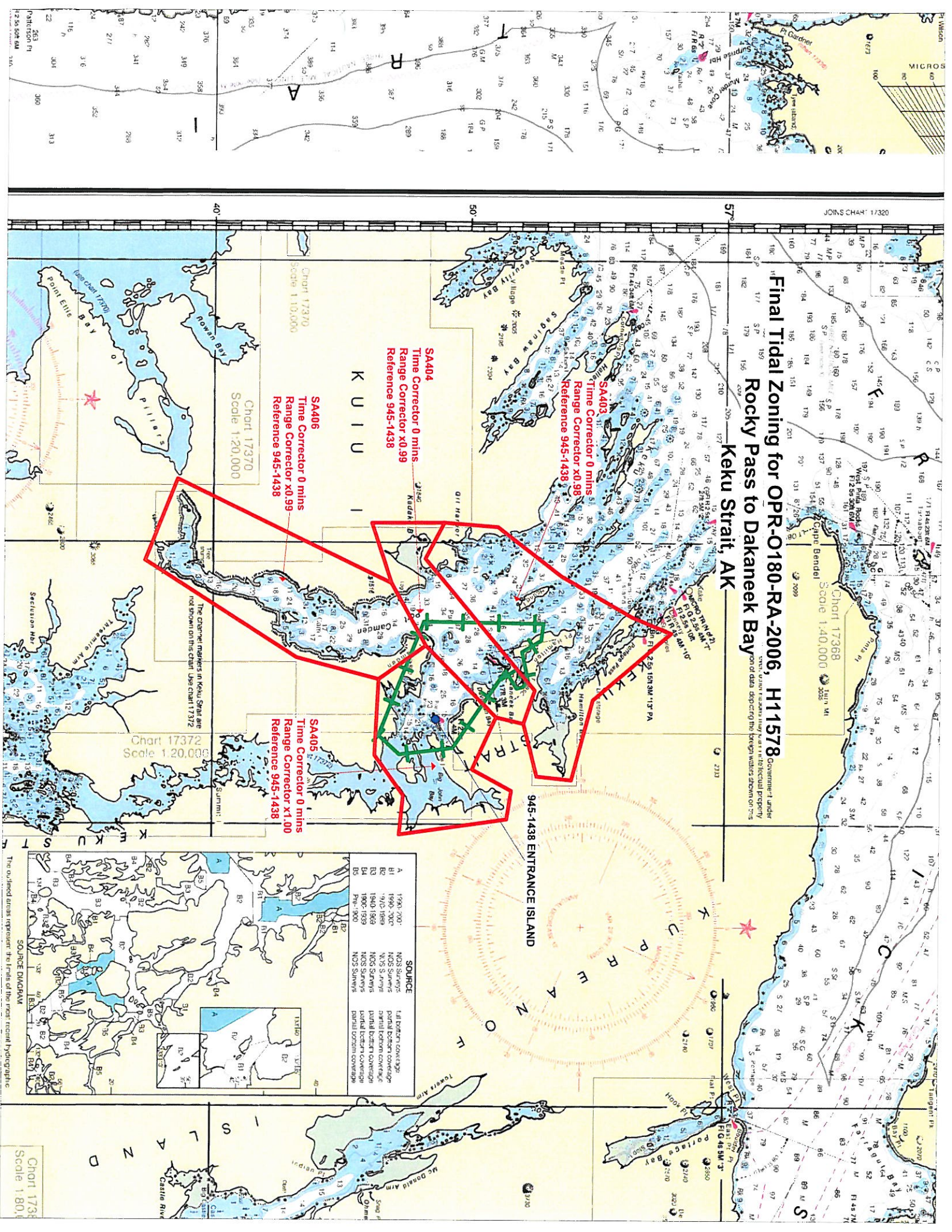
fm 

CHIEF, PRODUCTS AND SERVICES DIVISION



Final Tidal Zoning for OPR-O180-RA-2006, H11578 Rocky Pass to Dakaneek Bay

Keku Strait, AK



SA404
Time Corrector 0 mins
Range Corrector x0.99
Reference 945-1438

SA403
Time Corrector 0 mins
Range Corrector x0.98
Reference 945-1438

SA406
Time Corrector 0 mins
Range Corrector x0.99
Reference 945-1438

SA405
Time Corrector 0 mins
Range Corrector x1.00
Reference 945-1438

K U I U

945-1438 ENTRANCE ISLAND

SOURCE	
A	1990, 2007
B1	1990, 2007
B2	NOS Surveys
B3	NOS S. J. J. J.
B4	1960, 1959
B5	1960, 1959
B6	NOS Surveys
B7	NOS Surveys
B8	NOS Surveys
B9	NOS Surveys
B10	NOS Surveys
B11	NOS Surveys
B12	NOS Surveys
B13	NOS Surveys
B14	NOS Surveys
B15	NOS Surveys
B16	NOS Surveys
B17	NOS Surveys
B18	NOS Surveys
B19	NOS Surveys
B20	NOS Surveys
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B97	NOS Surveys
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B99	NOS Surveys
B100	NOS Surveys

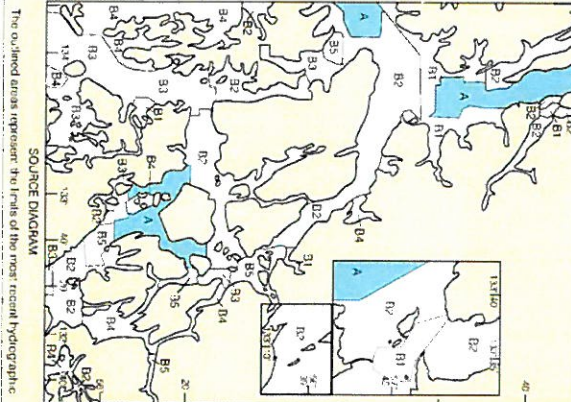


Chart 17370
Scale 1:10,000

Chart 17370
Scale 1:20,000

Chart 17372
Scale 1:20,000

Chart 17368
Scale 1:40,000

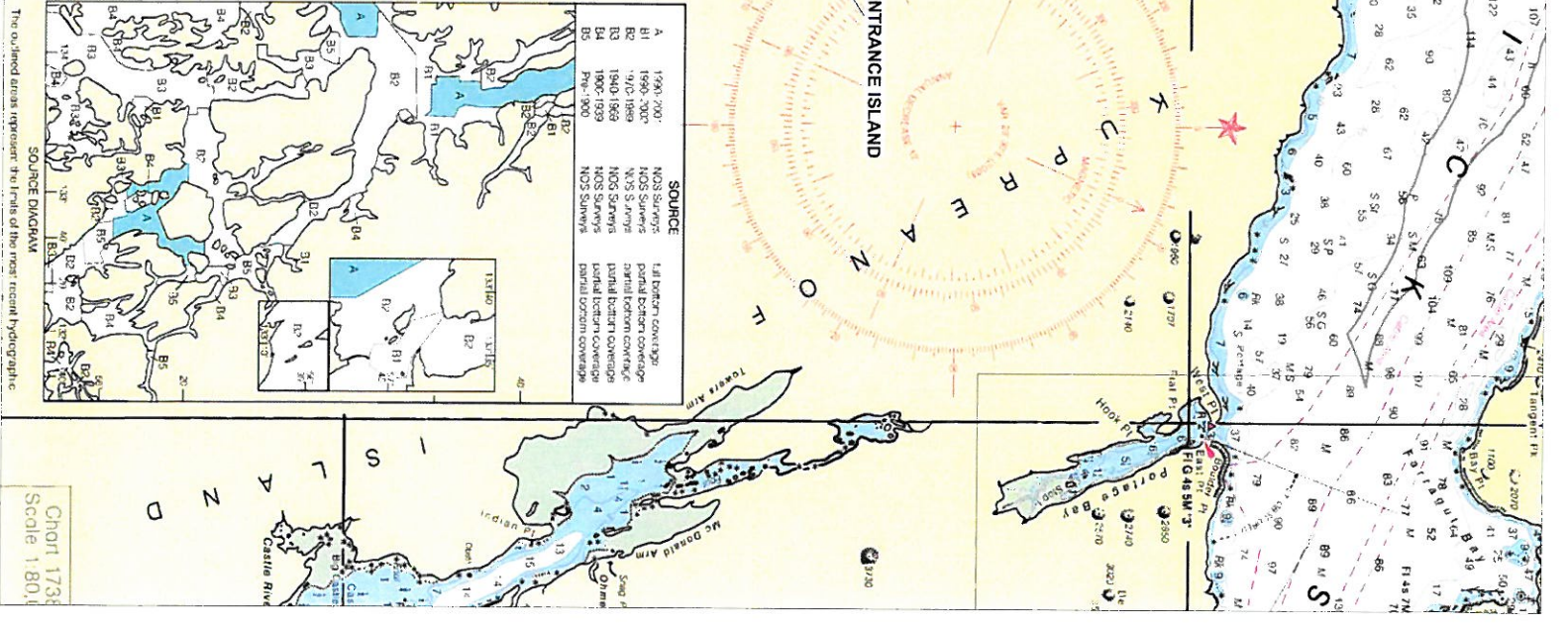
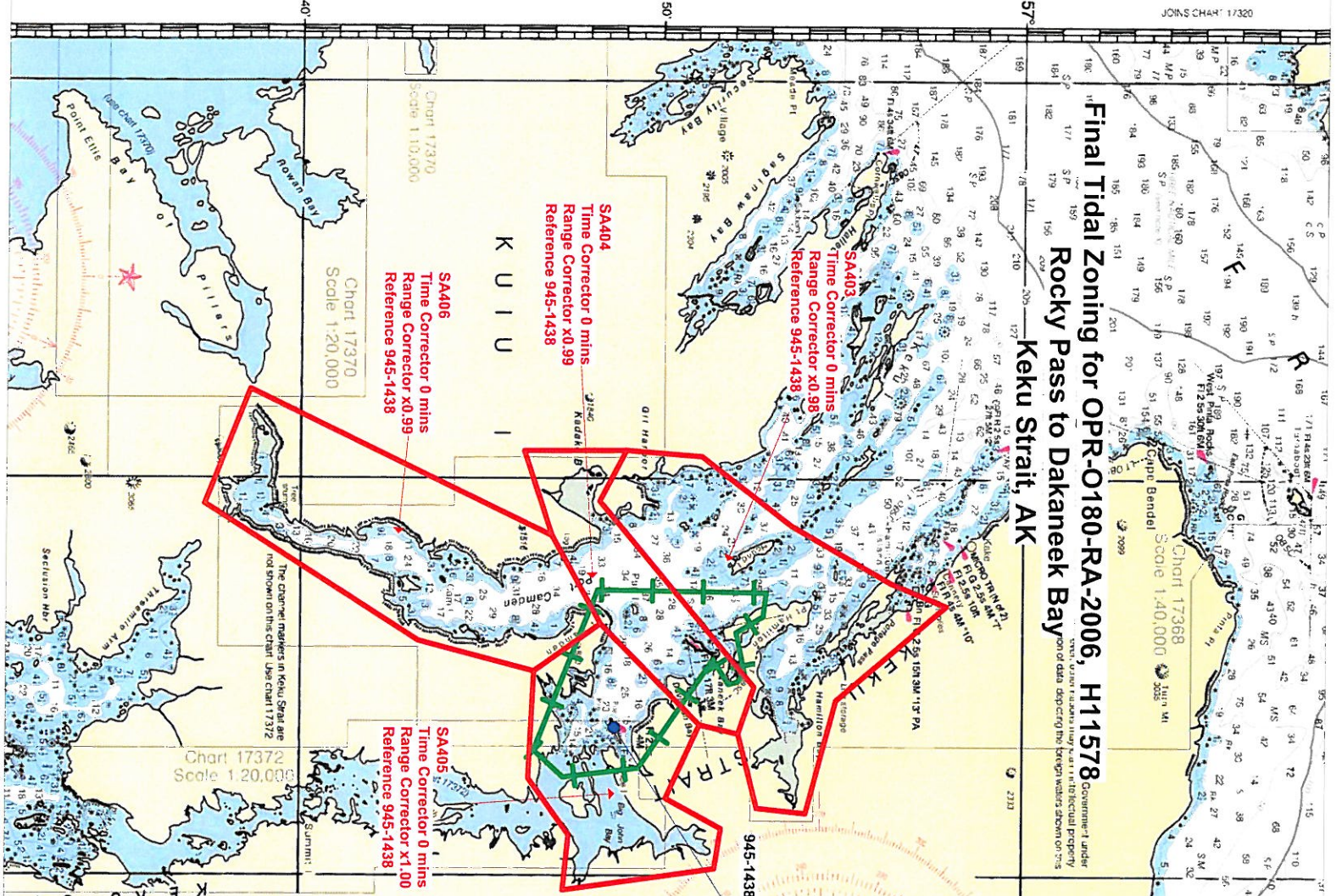
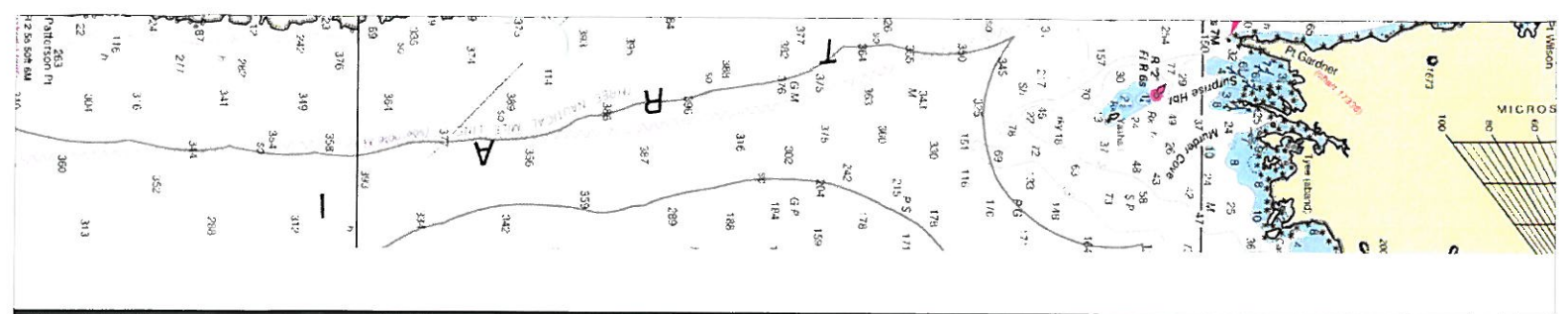
Chart 1736
Scale 1:80,000

The outlined areas represent the limits of the most recent hydrographic

The channel markers in Keku Strait are not shown on this chart. Use chart 17372

SOURCE DIAGRAM

Chart 1736
Scale 1:80,000



Final tide zone node point locations for OPR-O180-RA-2006, H11578

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 SA403	945-1438	0	0.98
-133.892769 56.964594			
-133.892769 56.964594			
-133.813506 56.913836			
-133.718731 56.900058			
-133.723064 56.877529			
-133.785345 56.86878			
-133.824802 56.876059			
-133.824802 56.876059			
-133.980324 56.80448			
-134.023095 56.81669			
-134.018207 56.851487			
-133.96011 56.892895			
-133.912009 56.938956			
-133.892769 56.964594			
Zone SA404	945-1438	0	0.99
-133.980324 56.80448			
-134.023095 56.81669			
-134.022554 56.769732			
-133.951413 56.782597			
-133.87764 56.805027			
-133.7929 56.85094			
-133.785345 56.86878			
-133.824802 56.876059			
-133.980324 56.80448			
Zone SA405	945-1438	0	1.00
-133.951413 56.782597			
-133.87764 56.805027			
-133.837711 56.774571			
-133.747567 56.772214			
-133.700186 56.790943			
-133.653744 56.788463			
-133.672157 56.858249			
-133.705734 56.861216			
-133.731188 56.835546			

-133.7929 56.85094
-133.87764 56.805027
-133.951413 56.782597
Zone SA406
-133.951413 56.782597
-134.074163 56.642696
-133.977708 56.621645
-133.863125 56.721084
-133.837711 56.774571
-133.87764 56.805027
-133.951413 56.782597

945-1438

0

0.99

H11578 HCell Report
Sarah Wolfskehl, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to provide new survey information in International Hydrographic Organization (IHO) format S-57 to update the largest scale ENC and RNC in the region:

ENC US5AK3TM
RNC 17368
RNC 17372

HCell compilation of survey H11578 utilized Office of Coast Survey HCell Specifications Version 3.1, with approved modifications to better align with PHB's HCell process and to meet MCD needs.

1. Compilation Scale

Depths for HCell H11578 were compiled to the largest scale charts in the region, 17372 (1:20,000) and 17368 (1:40,000). Density and distribution of soundings and features emulate both charts.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 5 meter combined surface in CARIS BASE Editor. A shoal-biased sounding set was made at two different sounding densities to reflect changing chart scales, using the Radius Tables below. The resultant sounding layer contains 18,233 depths.

For coverage over Chart 17372, 1:20,000		
Upper Limit (m)	Lower Limit (m)	Radius (mm)
0	30	3
30	70	3.5

For coverage over Chart 17368, 1:40,000		
Upper limit (m)	Lower limit (m)	Radius (mm)
0	30	4
30	70	4.5
70	112	5.5

In CARIS BASE Editor chart scale soundings were manually selected from the survey scale high density sounding layers and imported into a new layer. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

3. Depth Areas and Depth Contours

3.1 Depth Areas

The Base Surface H11578_combined_5m was used to auto generate a depth area. This depth area was used to generate the Meta layers.

3.2 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 generalized metric and fathom equivalent contour values are shown in the table below.

Chart Contours in Feet	Chart Contours in Fathoms	Metric Equivalent of Chart Contours	Metric Equivalent of Chart Contours Generalized	Actual Value of Chart Contours
6		1.8288	2.0574	6.75
12		3.657	3.8862	12.75
18	3	5.486	5.715	18.75, 3.125
	5	9.144	9.3726	5.125
	10	18.288	18.5166	10.125
	20	36.576	37.9476	20.75

Contours delivered in the *_SS file have not been deconflicted against shoreline features, soundings and hydrography as all other features in the *_CS file and soundings in the *_SS have been. This results in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_COVR, M_QUAL, DEPART, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

4. Meta Areas

The following Meta object areas are included in HCell H11578:

M_COVR
M_CSCL
M_QUAL

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

5. Features

Shoreline investigation was performed offshore of the Navigable Area Limit Line. Various rocks were DP'd for height and edits were made to shoreline features where necessary. One new foul area was delineated as well as modifications to several reefs. Refer to the HCell .000 file and Features Report portion of the DR for specific features

information. The source of all features included in the H11578 HCell can be determined by the SORIND field.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes
OBSTRN	Foul Area
DEPARE	The all-encompassing depth area
DEPCNT	Depth Contour
MARCUL	Shellfish Pen
M_COVR	Data coverage Meta object
M_CSCL	Chart Scale Meta Object
M_QUAL	Data quality Meta object
SBDARE	Bottom samples and rocky seabed areas
SOUNDG	Soundings at the chart scale density
UWTROC	Submerged LIDAR rock
WEDKLP	Kelp

The *_SS HCell contains the following Objects:

DEPCNT	Generalized contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

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

7. Blue Notes

Notes to the RNC and ENC chart compilers are included in the HCell as \$CSYMB features with the Blue Note information located in the INFORM field. By agreement with MCD, the NINFOM field is populated with an abbreviated version of the Blue Note (30 characters or less), describing the chart disposition, to be used by MCD in generating their Chart History spreadsheet.

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

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

9. Data Processing Notes

Survey H11578 junctions with H11579, from the same project, and is yet to be compiled.

10. QA/QC and ENC Validation Checks

H11578 was subjected to QA checks in S-57 Composer prior to exporting to the HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to 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

H11578_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:40,000.
H11578_SS.000	Base Cell File, Chart Units, Soundings compiled to 1:10,000.

H11578_DR.doc	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items.
H11578_outline.gml	Survey outline to populate SURDEX.

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, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.0	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.

12. Contacts

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

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APPROVAL SHEET
H11578

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the H-Cell compiled per the latest OCS H-Cell 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 disproval of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

I have reviewed the H-Cell, 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.