

H11230

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC

Field No. RA-10-06-03

Registry No. H-11230

LOCALITY

State Alaska

General Locality SW Alaska Peninsula

Sublocality Windy Bay and Middle Kuiu Bay

.....
2003
.....

CHIEF OF PARTY

..... CDR J.W.Humphrey, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11230

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-10-06-03

State Alaska

General Locality SW Alaska Peninsula

Sublocality Windy Bay and Middle Kuiukta Bay

Scale 1:10,000

Date of Survey 7/10/2003 - 8/10/2003

Instructions Date 7/3/2003

Project No. OPR-P182-RA-03

Vessel NOAA Ship launches RA1, RA2, RA4, RA5, RA6

Chief of Party CDR J.W. Humphrey, NOAA

Surveyed by RAINIER Personnel

Soundings taken by echo sounder Knudsen 320M, Reson SeaBat 8101&8125, Seabeam/Elac 1180

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by B. Taylor

Automated plot by HP Designjet 1050C

Verification by Keith H. Toepfer

Soundings in Fathoms and tenths

at

MLLW

REMARKS: Time in UTC. UTM Projection Zone 4

Revisions and annotations appearing as endnotes were

generated during office processing.

All separates are filed with the hydrographic data.

As a result, page numbering may be interrupted or non-sequential

Descriptive Report to Accompany Hydrographic Survey H11230

Project OPR-P182-RA-03
Southwest Alaska Peninsula, Alaska

Scale 1:10,000

July - August 2003

NOAA Ship RAINIER

Chief of Party: Commander John W. Humphrey, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P182-RA-03, dated July 3, 2003, and the Draft Standing Project Instructions dated March 21, 2001. The survey area is Kuiu Bay and the approaches, on the Gulf of Alaska side of the Alaska Peninsula and approximately 25 nautical miles SW of Castle Cape. This survey corresponds to sheet "AP" 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 greater than 100 meters from shore and deeper than 8 meters. Some additional coverage was obtained to obtain least depths over significant features or shoals inshore of this limit. 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 July 10 to August 10, 2003 (DN 191 to 222).¹

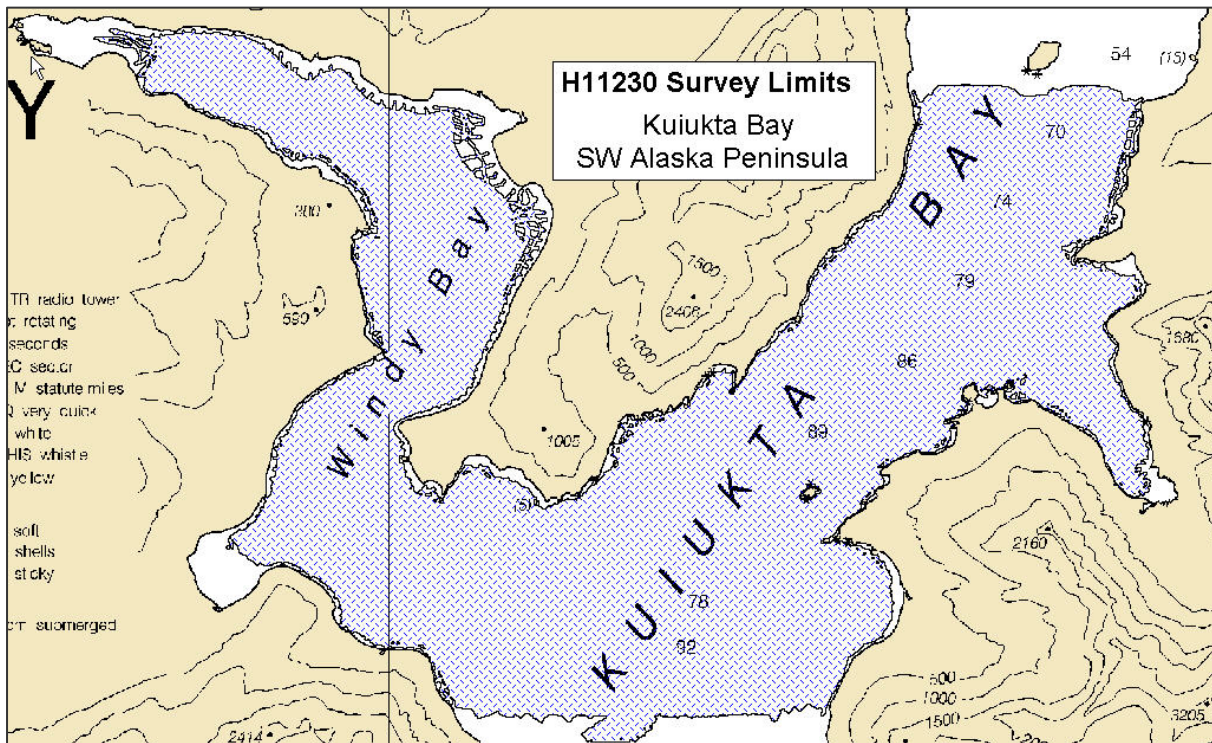


Figure 1. H11230 Survey Limits

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-P182-RA-03 Data Acquisition and Processing Report* (DAPR), submitted under separate cover.² Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.³

B1. Equipment and Vessels

Data were acquired by RAINIER survey launches RA1, RA2, RA4, RA5, and RA6. Vessels RA4, RA5, and RA6 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. Vessels RA1 and RA2 were used to acquire vertical-beam echo soundings (VBES) and detached positions (DPs) for shoreline verification. Vessel RA2 was also used to collect bottom samples.

No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

Vertical Beam Echo Sounder (VBES) crosslines including buffer lines totaled 23.83 nautical miles, comprising 62.28% of mainscheme hydrography. Crosslines generally agreed within 1 meter of mainscheme hydrography.

Shallow-Water Multibeam (SWMB) crosslines totaled 20.26 nautical miles, comprising 7.31% of SWMB hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode and agreed well with differences averaging less than 0.5 meter.

A statistical Quality Control Report has been conducted on representative data collected with each system used on this survey and is included in the *OPR-P182-RA-03 DAPR*. All systems collect⁴ data that meet IHO order 2 specifications or better.⁵

Through manual examination of the data and statistical analysis of data QC report accuracy standards for this survey have been met.⁶

Junctions

The following contemporary surveys junction with H11230:

Registry #	Scale	Date	Junction side⁷
H11229	1:10,000	2003	Northeast
H11231	1:10,000	2003	Southwest
H11232	1:10,000	2003	Southeast

Survey H11229 was not complete at the time of this report; the comparison will be noted in the report for H11229.⁸

Survey H11231 junctions well with this survey. A comparison in CARIS subset mode indicated differences were generally 1m or less in 0-50m of water and 1-3m in water deeper than 50m.⁹

Survey H11232 junctions well with this survey. A comparison in CARIS subset mode indicated differences were generally 0.5m or less in 0-50m of water and 1-2m in water deeper than 50m.¹⁰

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after the application of smooth tides.

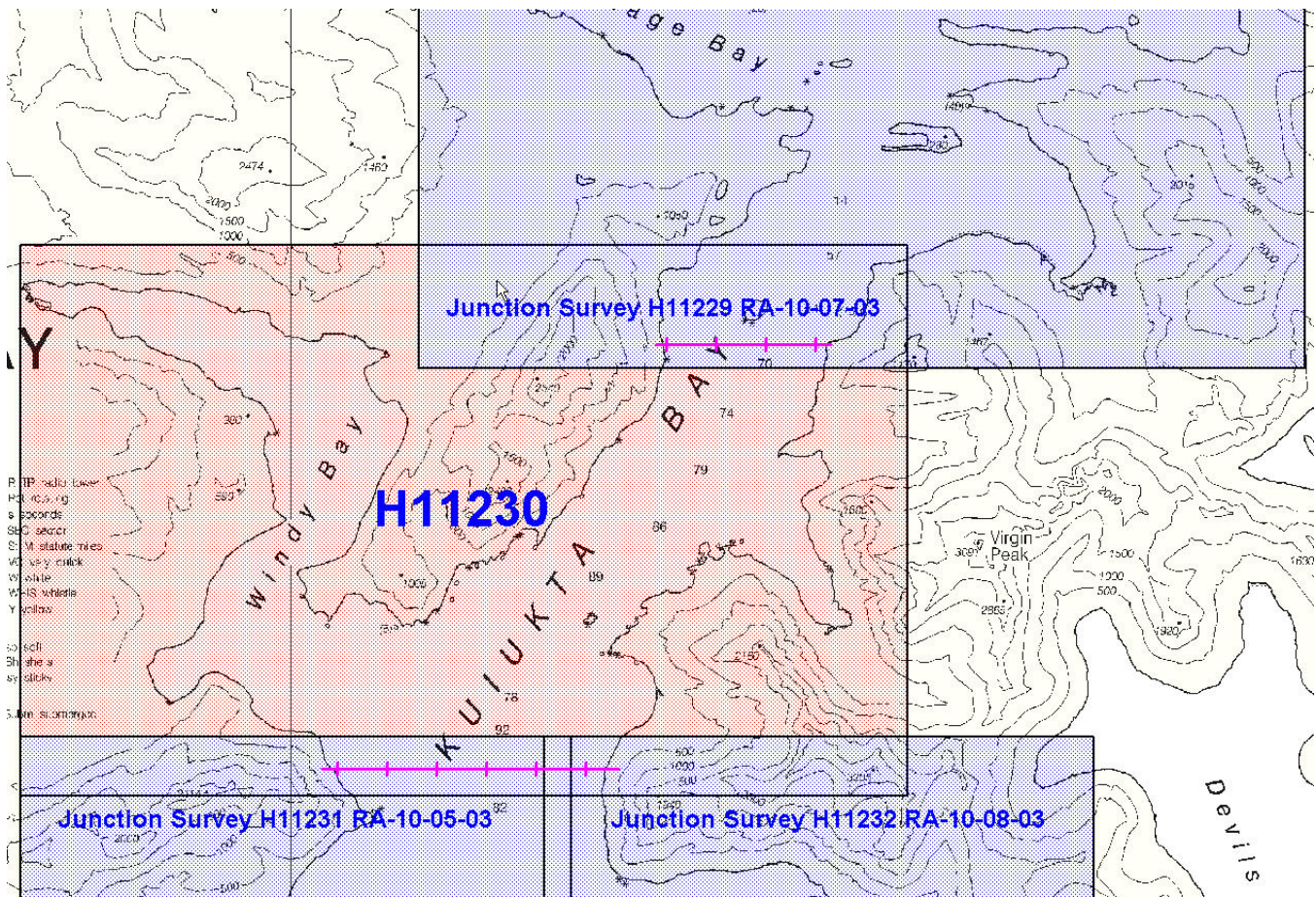


Figure 2. H11230 Junction Surveys.

Data Quality Factors

Sound Velocity

A sharp demarcation of water masses was observed in the field at the north end of Windy Bay. The Digibar showed higher values of salinity for the broad, relatively shallow, northwest trending part of the bay compared to those measured at the interface between it and the deeper basin to the south. For this reason, the sound velocity casts were performed for spatial as well as temporal distribution. Even so, in HDCS Subset Mode, small (less than one meter on the outer beams) sound velocity errors were found in the area of demarcation. As the entire length of these track lines was not affected, there is more than adequate coverage to compensate for the small errors. In areas where there is a Sound Velocity problem, the nadir beams from one line overlap the slight downturn of its neighbor's outer beams. The

decision not to filter these lines further than the standard 60° was made based on the fact that, if further filters were applied, it would create holes in the coverage areas not affected by the Sound Velocity issue.¹¹

Eel Grass

In several areas near shore, 10 meters and shoaler, thick eelgrass often obscured the detection of the bottom. On the VBES fathograms, acoustic returns from eelgrass usually appeared as a faint trace clearly separated from the bottom that had a darker, more definitive trace. In these cases, the VBES digital data were edited as necessary to reflect the true bottom. In the SWMB data, removal of soundings obtained over eelgrass was not possible in HDCS SwathEdit, as there is no definitive way to determine if a sounding is on a feature such as a rock or on eelgrass. In HDCS Subset Mode, in some instances, it was possible to discern the true bottom, as eelgrass often appeared as soundings “disconnected” from the continuous bottom. In these instances, soundings over eelgrass were rejected. However, when unable to clearly distinguish between the bottom and eelgrass, the eelgrass was not rejected. Areas with eelgrass were noted by the Hydrographer during shoreline verification and are also indicated in the “H11230_ShorelineNotes” table of the Detached Position and Bottom Sample Plot.¹²

B3. Data Reduction

Data reduction procedures for survey H11230 conform to those detailed in the *OPR-P182-RA-03 DAPR*.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11230 can be found in the *OPR-P182-RA-03 Horizontal and Vertical Control Report*¹³, 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 Cold Bay (289 kHz) were utilized during this survey. Launch-to-launch DGPS performance checks using U.S. Coast Guard beacon Kodiak Island (313 kHz) as the check station were performed in accordance with Section 3.2 of the FPM. Copies of the performance checks are included in the *OPR-P182-RA-03 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 Sand Point, AK (945-9450) served as control for datum determination and as the primary source for water level reducers for survey H11230.

RAINIER personnel installed Sutron 8210 “bubbler” tide gauge at the following subordinate station 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
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Hump Island	945- 8964	30-day	July 09, 2003	August 10, 2003
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All data were reduced to MLLW using unverified observed tides from station Sand Point, AK using the tide file 9459450.tid and time and height correctors using the zone corrector file P182RA2003CORP.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing.¹⁴ A request for delivery of final approved (smooth) tides for survey H11230 was forwarded to N/OPS1 on August 11, 2003. A copy of the request is included in Appendix IV.¹⁵

D. RESULTS AND RECOMMENDATIONS

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

There are no AWOIS items located within the limits of H11230.¹⁶

D.2 Chart Comparison

Survey H11230 was compared with chart 16561 (1st Ed.; Jan. 20, 2001, 1:80,000).¹⁷

Chart 16561

A lead-line survey was conducted in 1914 and these soundings are shown on chart 16561. The depths from survey H11230 are 0 to 14 fathoms shoaler than the soundings from this lead-line survey.¹⁸ This can be attributed to the limitations of a lead-line survey in very deep water and increased bottom coverage using SWMB.¹⁹

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.²⁰

Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.²¹

D.3 Shoreline

Shoreline Source

Vector photogrammetric project AK90902 was supplied by N/NGS3 in the form of a cartographic feature file (CFF). RAINIER conducted limited shoreline verification of the CFF. In addition, features shown on the current editions of charts 500, 16011, 16013, 16561, and 16566 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*.

A detailed Detached Position and Bottom Sample plot, in 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 "H11230_CFF_Shoreline"²² and shown in black. New MHW features and changes to the MHW shoreline, CFF or charted, are displayed in red in the "H11230_Shoreline_Updates" Mapinfo table. Charted shoreline, when used for reference purposes or when source data were not available, is depicted in the MapInfo table "H11230_Charted_Shoreline" and shown in brown.

Source Shoreline Changes and New Features

Charted (16561) rocks at 56°06'33.82"N, 158°35'44.71"W (525,140.54E, 6,218,328.58N); 56°07'18.19"N, 158°34'30.23"W (526,418.82E, 6,219,708.17N); 56°07'11.74"N, 158°32'49.38"W (528,161.66E, 6,219,519.90N); and 56°07'12.25"N, 158°37'37.42"W (523,186.54E, 6,219,506.28N) were compared to the CFF shoreline at 1:10,000 scale and were subsequently determined to be part of the CFF shoreline. The Hydrographer recommends removing these rocks from the chart and charting the shoreline as depicted in the DPBS plot.²³

Charted (16561) islets at 56°07'44.17"N, 158°36'07.48"W (524,734.83E, 6,220,501.29N) and 56°06'59.92"N, 158°38'14.77"W²⁴ (520,876.28E, 6,219,112.65N) were deemed part of the CFF shoreline during shoreline verification. The Hydrographer recommends removing these islets from the chart and charting the shoreline as depicted in the DPBS plot.²⁵

Charted (16561) islets at 56°06'29.92"N, 158°38'14.77"W²⁶ (525,511.41E, 6,218,209.77N) and 56°07'14.01"N, 158°32'52.33"W (528,110.53E, 6,219,589.58N) were compared to the CFF shoreline at 1:10,000 scale. The outline of these islets was altered because they overlapped the CFF shoreline. The Hydrographer recommends these islets be charted as depicted in the DPBS plot.²⁷

Charted (16561) islets at 56°07'05.57"N, 158°37'48.16"W (523,002.75E, 6,219,298.38N) and 56°06'58.47"N, 158°37'52.00"W (522,944.61E, 6,219,078.35N) were compared to the buffer line collected during shoreline verification. The eastern shore of these islets was determined by using the buffer line as the seaward most extent. The Hydrographer recommends these islets be charted as depicted in the DPBS plot.²⁸

Recommendations

The Hydrographer recommends that the shoreline as depicted on the Detached Position and Bottom Sample and final sounding Mapinfo digital file supersede and complement shoreline information compiled on the CFF and charts as noted.²⁹ 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 "H11230_Shoreline_Notes."³⁰

D.4 Dangers to Navigation

Seven dangers to navigation were found and reported to the Marine Chart Division (MCD) for verification and final submission to the Seventeenth Coast Guard District on November 10, 2003 in the form of a digital XML file "H11230_DTON1.xml".³¹ A copy of the preliminary Danger to Navigation file is included with the digital data.

D.5 Aids to Navigation

No aids to navigation (ATONs) are located within the limits of H11230.³²

D.6 Miscellaneous

Bottom samples were collected and are depicted on the Detached Position and Bottom Sample Plot. There are no charted bottom samples to compare with.³³

Raw XTF data were discovered to be missing from the RAID storage device. Unfortunately this discovery apparently occurred after the 2-week window during which the missing data could have been recovered from the automated back-up files. An additional search of all other possible locations also revealed no trace of the missing data. No XTF data from vessels RA4 and RA5 are included with the digital data submission.

In February 2004, the RAINIER was informed of a bug in CARIS SBEdit that incorrectly changes the Observed depths if the VBES data is processed in the following manner: SVP correct (at least once), followed by depth edits (includes accept/reject flagging), followed by an additional SVP correct and merge. By reconvertting the raw VBES lines on survey H11230 and copying the SLRange, SLRangeLineSegments, SLRangeTmIdx files into the original processed line file folders, and re-merging, the errors from the Sbedit bug were removed. After comparing the original data to the reconverted data, it was found that 28% of the soundings that had the same latitude and longitude had depth differences greater than 0.05m. The range of the differences was from 0.052m to 0.521m with 70% of the differences found to be greater than or equal to 0.4m. The submitted HDCS_DATA for this survey includes the corrected VBES depths and meets requirements.³⁴

E. APPROVAL

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this survey 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 2003.

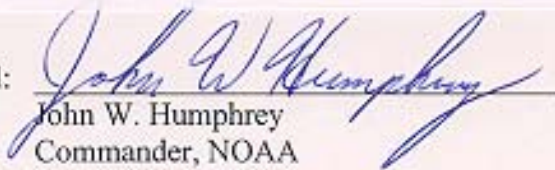
The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H11230 is complete and adequate to supersede charted soundings³⁵ in their common areas. No additional work is required for this survey.³⁶

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

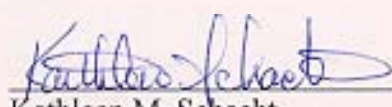
<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P182-RA-03	12/09/03	N/CS34
Horizontal and Vertical Control Report for OPR-P182-RA-03	4/30/04	N/CS34
Tides and Water Levels Package for OPR-P182-RA-03	10/20/03	N/OPS1
Coast Pilot Report for OPR-P182-RA-03	1/28/04	N/CS26

Approved and Forwarded:


 John W. Humphrey
 Commander, NOAA
 Commanding Officer

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

Survey Sheet Manager:


 Kathleen M. Schacht
 Survey Technician, NOAA

Field Operations Officer:


 Richard A. Fletcher
 Lieutenant Commander, NOAA

Revisions Compiled During Office Processing and Certification

- ¹ Concur.
- ² Filed with the project reports.
- ³ Concur with statements as discussed below.
- ⁴ Strikethrough ~~collect~~, replace with “collected”.
- ⁵ Do not concur. As discussed in the PHB H11230 Survey Certification Memo (filed with the hydrographic data), data should conform to specifications set forth in the HSSDM requiring that the data meet IHO Order 1 specifications in water depths less than 100 meters. After examination of data subsets, the reviewer concluded that H11230 met IHO Order 1 specifications in waters less than 100 meters. The data is acceptable for charting.
- ⁶ Concur. H11230 is adequate to supersede all prior surveys and charted miscellaneous source data in the common areas except as noted in this report and the Hdrawing.
- ⁷ Concur.
- ⁸ In PHB processing, H11230 compared well with H11229, generally to within one fathom or less.
- ⁹ Concur.
- ¹⁰ Concur.
- ¹¹ Data analysis during office processing indicates data is consistent and acceptable for charting.
- ¹² Filed with the hydrographic data. Eel grass areas are noted on the smooth sheet and Hdrawing. Chart according to the smooth sheet and Hdrawing.
- ¹³ Filed with the project reports.
- ¹⁴ Approved Tide Note dated September 28, 2004 is attached to this report.
- ¹⁵ Filed with the hydrographic data.
- ¹⁶ Concur.
- ¹⁷ In PHB processing, H11230 was also compared with the continuous maintenance raster dated 3/6/06 for Chart 16566, scale 1:77,477, 11th Edition, and the continuous maintenance raster dated 12/27/06 for Chart 16561, 2nd Edition. Chart 16566 depicted no soundings in the survey area, and nearshore features appeared not to have been updated with contemporary RSD. The hydrographer displayed verified updated features from Chart 16561 on the DPBS plot (filed with the hydrographic data). Therefore retained charted features on the smooth sheet were determined from Chart 16561, not the larger scale Chart 16566. Chart shoreline and features according to the smooth sheet.
- ¹⁸ Concur with clarification. After the application of smooth tides, soundings from H11230 were 0-10 fathoms shoaler than charted soundings.
- ¹⁹ Concur.
- ²⁰ Concur.
- ²¹ No changes to the hydrographer’s chart comparison were found after the application of smooth tides except as discussed in endnote 16.
- ²² MapInfo tables discussed in the descriptive report are filed with the hydrographic data.
- ²³ Concur with clarification. Chart according to the smooth sheet.
- ²⁴ Strikethrough ~~158°38’14.77”W~~, replace with “158°39’51.33”W”.
- ²⁵ Concur with clarification. Chart according to the smooth sheet.
- ²⁶ Strikethrough ~~158°38’14.77”W~~, replace with “158°35’23.29”W”.
- ²⁷ Concur with clarification. Chart according to the smooth sheet.

²⁸ Concur with clarification. The outline of the islets cannot be accurately depicted at chart scale. Retain minimum sized islets as depicted on the Hdrawing.

²⁹ Concur with clarification. Chart as depicted on the smooth sheet. Note the following from the DPBS plot:

- ✚ In the vicinity of Lat 59/9/10.2N and Lon 158/42/27.8W, MapInfo table H11230_Shoreline_Updates shows an approximate MLLW line. Since this line is inshore of the VBES MLLW line, it has not been depicted on the smooth sheet.

- ✚ Charted islet at Lat 56/7/24.5N and Lon 158/33/59.4W was found by the survey to be a reef as shown on H11230_Shoreline_Updates. Due to scale, chart rock at reef position as depicted on the Hdrawing.

³⁰ Shoreline verification information was analyzed during office processing and shown on the smooth sheet as warranted.

³¹ Attached to this report. During Office Review, DtoN H11230/R4RE_2003/2003-207/126_2257/25471/239 was identified as a flier. A new DtoN report was submitted for the correct nearby shoal sounding, identified as H11230/r1sb_2003/2003-192/305_2241/69/1 and is attached to this report. Chart 0 fm 2 foot sounding at smooth sheet position as depicted on the Hdrawing. The DtoN H11230/r5re_2003/2003-221/082_2008/482/1 is identified as a rock on the DPBS plot. Chart rock as depicted on the smooth sheet and Hdrawing.

In some instances where shoaler soundings or features fell near reported DtoNs, the shoaler soundings or features are depicted on the Hdrawing in preference to reported DtoNs. Chart all areas according to the smooth sheet and Hdrawing.

³² Concur.

³³ Concur. Bottom characteristics discovered in H11230 have been shown on the smooth sheet. Chart bottom characteristics as depicted on the smooth sheet and Hdrawing.

³⁴ Concur.

³⁵ Insert “and features”.

³⁶ Concur.

H11230 DTON Report

Registry Number: H11230
State: Alaska
Locality: SW Alaska Peninsula
Sub-locality: Windy Bay and Middle Kuiu Bay
Project Number: OPR-P182-RA-03
Survey Dates: 07/11/2003 - 08/10/2003

Charts Affected

Number	Version	Date	Scale
16566	10th Ed.	02/20/99	1:77477
16561	1st Ed.	01/20/01	1:80000
16013	28th Ed.	04/14/01	1:969761
16011	35th Ed.	12/02/00	1:1023188
16006	33rd Ed.	12/23/00	1:1534076
500	7th Ed.	06/01/96	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

Features

Feature Type	Survey Depth [m]	Survey Latitude	Survey Longitude
Sounding	0.57 m	056° 07' 09.051" N	158° 37' 26.283" W
Sounding	2.08 m	056° 08' 59.801" N	158° 40' 48.740" W
Sounding	2.88 m	056° 08' 34.781" N	158° 39' 18.291" W
Sounding	3.00 m	056° 08' 15.951" N	158° 38' 44.935" W
Sounding	3.10 m	056° 06' 30.086" N	158° 41' 24.440" W
Sounding	4.13 m	056° 07' 00.417" N	158° 35' 19.038" W
Sounding	5.56 m	056° 08' 04.597" N	158° 33' 42.609" W

1.1) Profile/Beam - 482/1 from h11230 / r5re_2003 / 2003-221 / 082_2008

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 07' 09.051" N, 158° 37' 26.283" W
Least Depth: 0.57 m
Timestamp: 2003-221.20:10:13.169 (08/09/2003)
Survey Line: h11230 / r5re_2003 / 2003-221 / 082_2008
Profile/Beam: 482/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Rock

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r5re_2003/2003-221/082_2008	482/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart submerged rock

Cartographically-Rounded Depth (Affected Charts):
 0 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 .5m (500_1, 50_1)

1.2) Profile/Beam - 25471/239 from h11230 / r4re_2003 / 2003-207 / 126_2257

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 08' 59.801" N, 158° 40' 48.740" W
Least Depth: 2.08 m
Timestamp: 2003-207.23:25:15.999 (07/26/2003)
Survey Line: h11230 / r4re_2003 / 2003-207 / 126_2257
Profile/Beam: 25471/239
Charts Affected: 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r4re_2003/2003-207/126_2257	25471/239	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):

1fm (16561_1, 16013_1, 16011_1, 16006_1, 530_1)

2.1m (500_1, 50_1)

1.3) Profile/Beam - 303/1 from h11230 / r1sb_2003 / 2003-192 / 357_2157

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 08' 34.781" N, 158° 39' 18.291" W
Least Depth: 2.88 m
Timestamp: 2003-192.21:58:21.051 (07/11/2003)
Survey Line: h11230 / r1sb_2003 / 2003-192 / 357_2157
Profile/Beam: 303/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r1sb_2003/2003-192/357_2157	303/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):

1 ½fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)

2.9m (500_1, 50_1)

1.4) Profile/Beam - 13522/236 from h11230 / r4re_2003 / 2003-207 / 126_2257

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 08' 15.951" N, 158° 38' 44.935" W
Least Depth: 3.00 m
Timestamp: 2003-207.23:12:20.046 (07/26/2003)
Survey Line: h11230 / r4re_2003 / 2003-207 / 126_2257
Profile/Beam: 13522/236
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r4re_2003/2003-207/126_2257	13522/236	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):

1 ½fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 3.0m (500_1, 50_1)

1.5) Profile/Beam - 21/10 from h11230 / r5re_2003 / 2003-221 / 071_1848

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 06' 30.086" N, 158° 41' 24.440" W
Least Depth: 3.10 m
Timestamp: 2003-221.18:49:40.064 (08/09/2003)
Survey Line: h11230 / r5re_2003 / 2003-221 / 071_1848
Profile/Beam: 21/10
Charts Affected: 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r5re_2003/2003-221/071_1848	21/10	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):

1 ¾fm (16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 3.1m (500_1, 50_1)

1.6) Profile/Beam - 134/43 from h11230 / r5re_2003 / 2003-222 / 005_2143

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 07' 00.417" N, 158° 35' 19.038" W
Least Depth: 4.13 m
Timestamp: 2003-222.21:45:25.450 (08/10/2003)
Survey Line: h11230 / r5re_2003 / 2003-222 / 005_2143
Profile/Beam: 134/43
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r5re_2003/2003-222/005_2143	134/43	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):
 2 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 4.1m (500_1, 50_1)

1.7) Profile/Beam - 1229/55 from h11230 / r5re_2003 / 2003-204 / 029_2220

DANGER TO NAVIGATION

Survey Summary

Survey Position: 056° 08' 04.597" N, 158° 33' 42.609" W
Least Depth: 5.56 m
Timestamp: 2003-204.22:25:17.417 (07/23/2003)
Survey Line: h11230 / r5re_2003 / 2003-204 / 029_2220
Profile/Beam: 1229/55
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1
Remarks:
 Shoal sounding

Feature Correlation

Line	Feature	Range	Azimuth	Status
r:/h11230_sheetap/h11230_processed/h11230_hdcs/h11230/r5re_2003/2003-204/029_2220	1229/55	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):
 3fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 5.5m (500_1, 50_1)

Office-identified DTON

Registry Number: H11230
State: Alaska
Locality: SW Alaska Peninsula
Sub-locality: Windy Bay and Middle Kuiu Bay
Project Number: OPR-P182-RA-03
Survey Date: 07/11/2003

This DTON was identified as a replacement for DTON H11230/R4RE_2003/2003-207/126_2257/25471/239, which was located on a feature that was evaluated as a probable flier.

Charts Affected

Number	Version	Date	Scale
16561	1st Ed.	01/20/01	1:80000
16013	28th Ed.	04/14/01	1:969761
16011	35th Ed.	12/02/00	1:1023188
16006	33rd Ed.	12/23/00	1:1534076
500	7th Ed.	06/01/96	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	0.39 m	056° 09' 00.351" N	158° 40' 45.204" W	---

1.1) Profile/Beam - 69/1 from h11230 / r1sb_2003 / 2003-192 / 305_2241**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 056° 09' 00.351" N, 158° 40' 45.204" W
Least Depth: 0.39 m
Timestamp: 2003-192.22:41:57.015 (07/11/2003)
Survey Line: h11230 / r1sb_2003 / 2003-192 / 305_2241
Profile/Beam: 69/1
Charts Affected: 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

Shoal sounding

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r1sb_2003/2003-192/305_2241	69/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart sounding

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (16561_1, 16013_1, 16011_1, 16006_1, 530_1)

.4m (500_1, 50_1)

S-57 Data**Geo object 1:** Sounding (SOUNDG)



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: September 28, 2004

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P182-RA-2003
HYDROGRAPHIC SHEET: H11230

LOCALITY: Windy Bay and Middle Kuiu Bay, AK
TIME PERIOD: July 10 - August 10, 2003

TIDE STATION USED: 945-8964 Hump Island, Alaska
Lat. $56^{\circ} 06.8'N$ Lon. $158^{\circ} 35.9'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.174 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SWA169A & SWA169B.

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).

for *[Signature]*

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

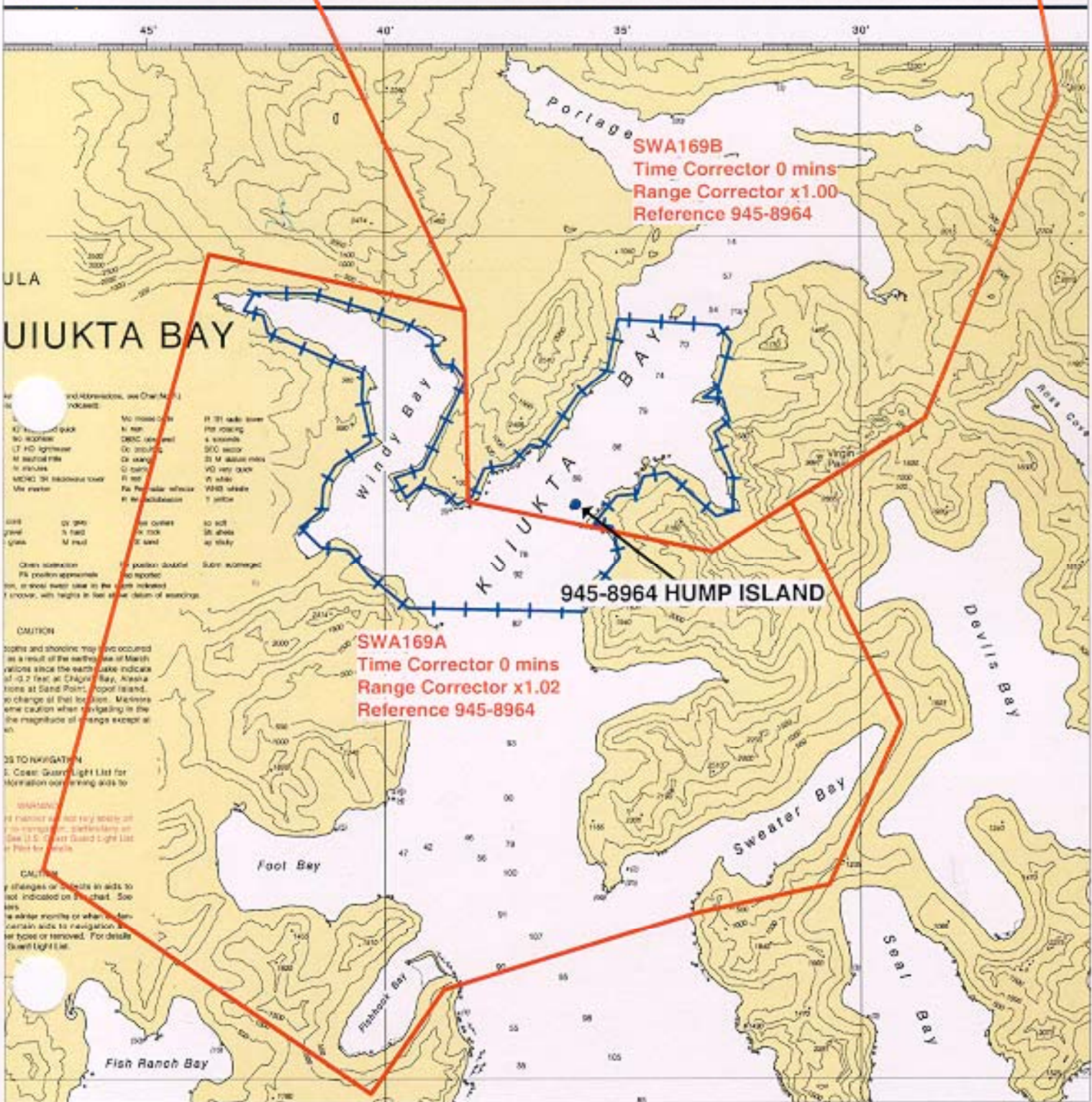
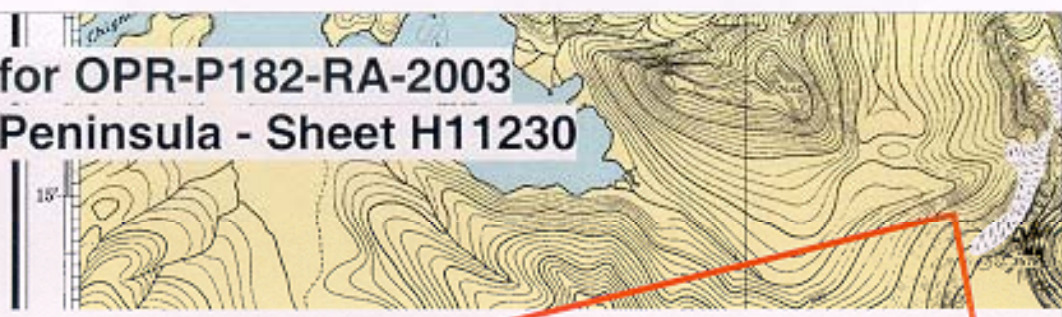


Final tide zone node point locations for OPR-P182-RA-2003, Sheet H11230.

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 SWA169A	945-8964	0	1.02
-158.556712 56.03303			
-158.510936 56.038617			
-158.48576 56.070531			
-158.523965 56.114338			
-158.55134 56.104644			
-158.594428 56.10955			
-158.637321 56.114508			
-158.63846 56.15224			
-158.728106 56.163161			
-158.786681 56.04173			
-158.671891 55.997061			
-158.646196 56.017708			
-158.556712 56.03303			
Zone SWA169B	945-8964	0	1.00
-158.63846 56.15224			
-158.691185 56.214342			
-158.447246 56.247319			
-158.430272 56.19459			
-158.477124 56.130876			
-158.523965 56.114338			
-158.55134 56.104644			
-158.594428 56.10955			
-158.637321 56.114508			
-158.63846 56.15224			

Final Tidal Zoning for OPR-P182-RA-2003 Southwest Alaska Peninsula - Sheet H11230



SWA169B
Time Corrector 0 mins
Range Corrector x1.00
Reference 945-8964

945-8964 HUMP ISLAND

SWA169A
Time Corrector 0 mins
Range Corrector x1.02
Reference 945-8964

CAUTION
depths and shoreline may have occurred as a result of the melting ice of March glaciers since the earth quake indicates of 0.7 feet at Chignik Bay, Alaska from at Sand Point, Popoff Island, so change of this too soon. Mariners use caution when navigating in the magnitude of change except at 10.

CAUTION
depths and shoreline may have occurred as a result of the melting ice of March glaciers since the earth quake indicates of 0.7 feet at Chignik Bay, Alaska from at Sand Point, Popoff Island, so change of this too soon. Mariners use caution when navigating in the magnitude of change except at 10.

CAUTION
depths and shoreline may have occurred as a result of the melting ice of March glaciers since the earth quake indicates of 0.7 feet at Chignik Bay, Alaska from at Sand Point, Popoff Island, so change of this too soon. Mariners use caution when navigating in the magnitude of change except at 10.

CAUTION
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CAUTION
depths and shoreline may have occurred as a result of the melting ice of March glaciers since the earth quake indicates of 0.7 feet at Chignik Bay, Alaska from at Sand Point, Popoff Island, so change of this too soon. Mariners use caution when navigating in the magnitude of change except at 10.

Registry Number: H11230
State: Alaska
Locality: SW Alaska Peninsula
Sub-locality: Windy Bay and Middle Kuiu Bay
Project Number: OPR-P182-RA-03
Survey Dates: 07/11/2003 - 08/10/2003

Charts Affected

Number	Version	Date	Scale
16566	10th Ed.	02/20/99	1:77477
16561	1st Ed.	01/20/01	1:80000
16013	28th Ed.	04/14/01	1:969761
16011	35th Ed.	12/02/00	1:1023188
16006	33rd Ed.	12/23/00	1:1534076
500	7th Ed.	06/01/96	1:3500000
530	30th Ed.	03/23/02	1:4860700
50	5th Ed.	07/30/94	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Sounding	-8.61 m	056° 06' 40.522" N	158° 35' 40.559" W	---
1.2	Sounding	-7.92 m	056° 07' 20.234" N	158° 34' 20.403" W	---
1.3	Sounding	-15.13 m	056° 07' 22.737" N	158° 34' 04.451" W	---
1.4	Sounding	-11.39 m	056° 08' 01.133" N	158° 33' 31.135" W	---
1.5	Sounding	3.59 m	056° 07' 15.063" N	158° 34' 32.680" W	---
1.6	Sounding	-7.50 m	056° 07' 21.045" N	158° 36' 44.854" W	---
1.7	Sounding	-11.52 m	056° 07' 15.909" N	158° 37' 12.100" W	---
1.8	Sounding	-1.02 m	056° 08' 12.808" N	158° 40' 10.919" W	---
1.9	Sounding	7.70 m	056° 07' 09.290" N	158° 37' 36.635" W	---
1.10	Sounding	2.07 m	056° 08' 45.636" N	158° 34' 58.798" W	---
2.1	Shoal	2.21 m	056° 08' 59.801" N	158° 40' 48.740" W	---
2.2	Shoal	3.14 m	056° 08' 15.951" N	158° 38' 44.935" W	---

2.3	Shoal	2.95 m	056° 08' 34.781" N	158° 39' 18.291" W	---
2.4	Shoal	3.30 m	056° 06' 30.086" N	158° 41' 24.440" W	---
2.5	Shoal	4.27 m	056° 07' 00.417" N	158° 35' 19.038" W	---
2.6	Shoal	5.68 m	056° 08' 04.597" N	158° 33' 42.609" W	---
2.7	Rock	0.80 m	056° 07' 09.051" N	158° 37' 26.283" W	---

1 - New Features

1.1) 21921596

Survey Summary

Survey Position: 056° 06' 40.522" N, 158° 35' 40.559" W
Least Depth: -8.61 m
Timestamp: 2003-192.16:00:28.000 (07/11/2003)
DP Dataset: h11230 / r2ne_2003 / 2003-192 / dp2192
Profile/Beam: 2/1
Charts Affected: 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk is new islet
 Grass is growing on top, approximately 5x5 meters.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2ne_2003/2003-192/dp2192	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and chart islet as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-4 ¾fm (16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -8.6m (500_1, 50_1)

Office Notes

Concur with clarification. Replace "DPBS plot" with "smooth sheet."

1.2) 21921678

Survey Summary

Survey Position: 056° 07' 20.234" N, 158° 34' 20.403" W
Least Depth: -7.92 m
Timestamp: 2003-192.17:02:54.000 (07/11/2003)
DP Dataset: h11230 / r2ne_2003 / 2003-192 / dp2192
Profile/Beam: 9/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk is new islet
 Grass is growing on top.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2ne_2003/2003-192/dp2192	9/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and chart islet as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-4 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -7.9m (500_1, 50_1)

Office Notes

Concur with clarification. Replace "DPBS plot" with "smooth sheet."

1.3) 21921707

Survey Summary

Survey Position: 056° 07' 22.737" N, 158° 34' 04.451" W
Least Depth: -15.13 m
Timestamp: 2003-192.17:32:03.000 (07/11/2003)
DP Dataset: h11230 / r2ne_2003 / 2003-192 / dp2192
Profile/Beam: 13/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk is new islet
 Grass on top.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2ne_2003/2003-192/dp2192	13/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and chart islet as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-8 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -15.2m (500_1, 50_1)

Office Notes

Concur with clarification. Replace "DPBS plot" with "smooth sheet."

1.4) 21921808

Survey Summary

Survey Position: 056° 08' 01.133" N, 158° 33' 31.135" W
Least Depth: -11.39 m
Timestamp: 2003-192.18:05:29.000 (07/11/2003)
DP Dataset: h11230 / r2ne_2003 / 2003-192 / dp2192
Profile/Beam: 15/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk is new islet
 Grass is growing and there is a bald eagle nest on top.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2ne_2003/2003-192/dp2192	15/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and chart islet as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-6 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -11.4m (500_1, 50_1)

Office Notes

Concur with clarification. Replace "DPBS plot" with "smooth sheet."

1.5) 21921665

Survey Summary

Survey Position: 056° 07' 15.063" N, 158° 34' 32.680" W
Least Depth: 3.59 m
Timestamp: 2003-192.16:47:02.000 (07/11/2003)
DP Dataset: h11230 / r2es_2003 / 2003-192 / dp2192
Profile/Beam: 1/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

Chd (16561) rk disproval

Swell and chop were not present; 15 meter water visibility; average depth of search 3.8 meters; bottom was in sight during search and consisted of gravel, cobbles, and starfish; 50 meter search radius.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2es_2003/2003-192/dp2192	1/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove charted (16561) rock

Cartographically-Rounded Depth (Affected Charts):

2fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)

3.6m (500_1, 50_1)

Office Notes

Concur.

1.6) 119384

Survey Summary

Survey Position: 056° 07' 21.045" N, 158° 36' 44.854" W
Least Depth: -7.50 m
Timestamp: 2003-193.16:25:02.000 (07/12/2003)
DP Dataset: h11230 / r1ne_2003 / 2003-193 / dp1193
Profile/Beam: 2/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF Rk is Chd (16561) islet

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r1ne_2003/2003-193/dp1193	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and alter charted (16561) islet outline as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-4fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -7.5m (500_1, 50_1)

Office Notes

Concur with clarification. Retain islet as charted.

1.7) 1193106

Survey Summary

Survey Position: 056° 07' 15.909" N, 158° 37' 12.100" W
Least Depth: -11.52 m
Timestamp: 2003-193.16:38:07.000 (07/12/2003)
DP Dataset: h11230 / r1ne_2003 / 2003-193 / dp1193
Profile/Beam: 3/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk is Chd (16561) islet

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r1ne_2003/2003-193/dp1193	3/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock and alter charted (16561) islet outline as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

-6 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 -11.5m (500_1, 50_1)

Office Notes

Concur with clarification. Retain islet as charted.

1.8) 1193486

Survey Summary

Survey Position: 056° 08' 12.808" N, 158° 40' 10.919" W
Least Depth: -1.02 m
Timestamp: 2003-193.19:11:36.000 (07/12/2003)
DP Dataset: h11230 / r1ne_2003 / 2003-193 / dp1193
Profile/Beam: 10/1
Charts Affected: 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

Chd (16561) rk disproval

Actually the high point of a gravel spit with grass growing on the top; location of "rock" would be midway up the beach; only gravel was seen.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r1ne_2003/2003-193/dp1193	10/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove charted (16561) rock and chart gravel spit as depicted on the DPBS plot.

Cartographically-Rounded Depth (Affected Charts):

0 ½fm (16561_1, 16013_1, 16011_1, 16006_1, 530_1)

-1.0m (500_1, 50_1)

Office Notes

Concur with clarification. Chart revised MHWL as depicted on the smooth sheet and Hdrawing.

1.9) 1193128

Survey Summary

Survey Position: 056° 07' 09.290" N, 158° 37' 36.635" W
Least Depth: 7.70 m
Timestamp: 2003-193.16:58:07.000 (07/12/2003)
DP Dataset: h11230 / r1es_2003 / 2003-193 / dp1193
Profile/Beam: 1/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

CFF rk disproval
 The CFF rock was disproved with 100% SWMB.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r1es_2003/2003-193/dp1193	1/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove CFF rock

Cartographically-Rounded Depth (Affected Charts):

4 ¼fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)
 7.7m (500_1, 50_1)

Office Notes

Concur.

1.10) 2220168

Survey Summary

Survey Position: 056° 08' 45.636" N, 158° 34' 58.798" W
Least Depth: 2.07 m
Timestamp: 2003-220.11:31:07.000 (08/08/2003)
DP Dataset: h11230 / r2es_2003 / 2003-220 / dp2220
Profile/Beam: 1/1
Charts Affected: 16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

Chd (16561) rk disproval

No swell but slight wind chop; 3 meter water visibility; average water depth 2 meters; bottom was in sight for entire search and consisted of bedrock; search pattern was 100x30 meters; and search time was 4.5 minutes.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11230/r2es_2003/2003-220/dp2220	1/1	0.00	000.0	Primary

Hydrographer Recommendations

Remove charted (16561) rock.

Cartographically-Rounded Depth (Affected Charts):

1fm (16566_1, 16561_1, 16013_1, 16011_1, 16006_1, 530_1)

2.0m (500_1, 50_1)

Office Notes

Concur.

APPROVAL SHEET
H11230

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 disproof 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.

Bruce A. Olmstead
Bruce A. Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 11/27/2006

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
Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

Date: 28 Nov. 2006

