

H11325

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-20-02-04

Registry No. H-11325

LOCALITY

State Alaska

General Locality SW Alaska Peninsula

Sublocality Vicinity of Lighthouse Rocks

2004

CHIEF OF PARTY

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

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11325

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-20-02-04

State Alaska

General Locality SW Alaska Peninsula

Sublocality Vicinity of Lighthouse Rocks

Scale 1:20,000

Date of Survey 6/27/2004 - 7/27/2004

Instructions Date 4/23/2004

Project No. OPR-P182-RA-04

Vessel RA3(1021), RA5(1006), and Rainier (s221)

Chief of Party CDR J.W. Humphrey, NOAA

Surveyed by RAINIER Personnel

Soundings taken by echo sounder Reson SeaBat 8101, Seabeam/Elac 1050D MKII

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by B. Taylor

Automated plot by HP Designjet 1050C

Verification by Toshihiko Uozumi

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 H11325

Project OPR-P182-RA-04
Southwest Alaska Peninsula, AK

Scale 1:20,000¹

June - August 2004

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-04, dated April 23, 2004, Draft Standing Project Instructions dated March 23, 2004, and NOS Hydrographic Specifications and Deliverables dated March 2003. The survey area is Vicinity of Light House Rocks. This survey corresponds to sheet "AV" in the sheet layout provided with the Letter Instructions.

Due to time constraints, and mechanical problems with RAINIER, 100% SWMB coverage was not obtained in the survey area as specified per letter instructions. However, the area surveyed is considered complete, and is submitted as a completed project.

Data acquisition was conducted from June 27, 2004 to July 27, 2004 (DN 179 to 209).²

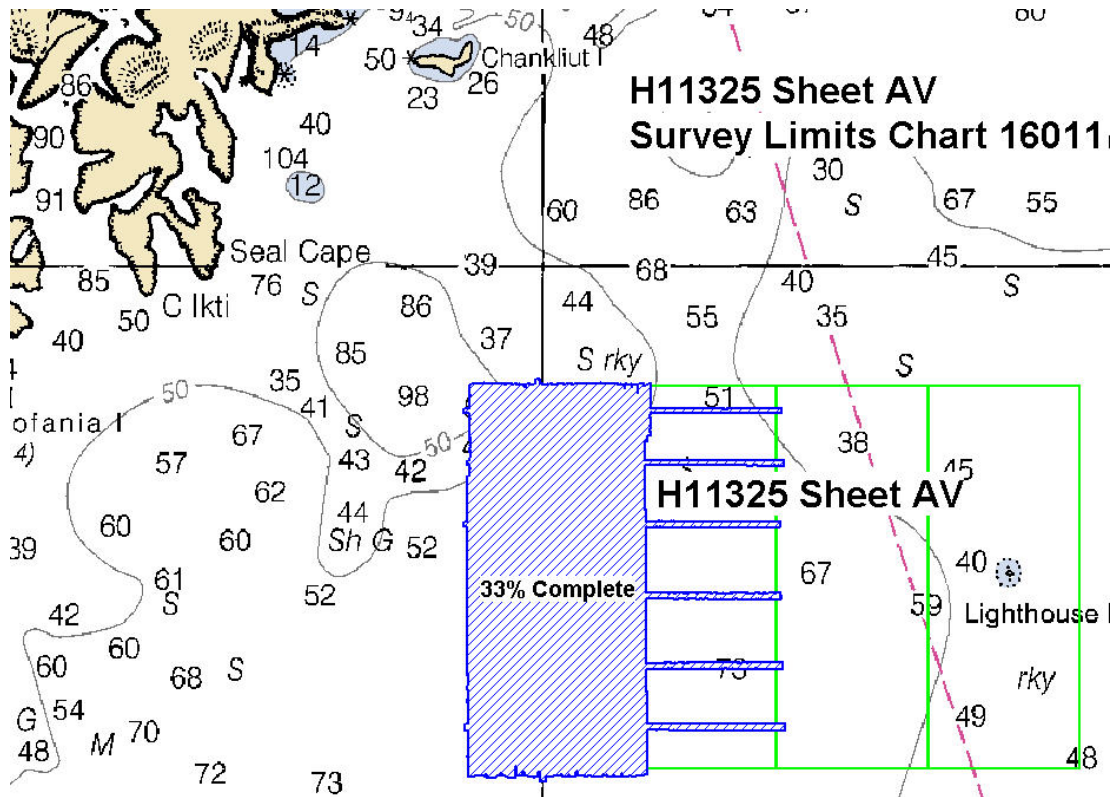


Figure 1. H11325 Survey Limits

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-04 Data Acquisition and Processing Report (DAPR)*, submitted under separate cover.³ Items specific to this survey, and any deviations from the aforementioned report are discussed in the following sections.

B1. Equipment and Vessels

Data were acquired by RAINIER Ship system, S221_ELAC_1050D (High Frequency), and RAINIER survey launches 1006, 1021. RAINIER and Vessels 1006,1021 were used to acquire shallow-water multibeam (SWMB) soundings and sound velocity profiles. No unusual vessel configurations were used for data acquisition.

B2. Quality Control

Crosslines

All crosslines were acquired on day number 179 by vessel S221 (Elac1050 high frequency). When comparing the shoalest depths of the crosslines to the data collected by vessel numbers 1006 and 1016,⁴ there is agreement within .75m. Crosslines generally agreed within 1 meter of mainscheme hydrography when comparing the data collected with vessel S221. Due to time restraints, crosslines for vessels 1006 and 1016⁵ (both RESON 8101) could not be acquired. As well, since crosslines were acquired on the first day of acquisition, they extend 5.5nm past collected data. The complete crosslines remain in order to reveal the depth in this area until the survey is completed.

Shallow-Water Multibeam (SWMB) crosslines totaled 46.8 nautical miles, comprising 5.4% of SWMB hydrography. The mainscheme bathymetry was manually compared to the XL nadir beams in CARIS subset mode and agreed with differences averaging approximately 1 meter.

A statistical Quality Control Report was generated for data acquired on the Lake Washington Reference Surface at the start of the season to validate launch offsets and sonar biases. A copy of this report is included in the OPR-P182-RA-04 DAPR.

A Quality Control Report has been conducted on data collected with Elac1050 and is included in the *OPR-P182-RA-04 DAPR*.

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

Junctions

There are no contemporary surveys that junction with H11325.⁷

Data Quality Factors

During processing, Elac data collected by S221 on day numbers (DN) 179, 190, and 191 exhibited a slight “v” pattern with the outer beams being 1-2 meters higher than the nadir beams. Eventually this problem was traced to incorrect roll bias values computed by Elac Hydrostar software during S221’s patch test. DN’s 179 and 119⁸ were corrected by entering the difference between roll bias values computed by hydrostar and another set computed by hand into the VCF. On DN 190 the acquisition program crashed before data acquisition and zeroed out the roll bias values in the ship file. These data were corrected by entering the roll bias values computed by hand into the VCF. All data collected after DN 201 were run with the “correct” hand computed values entered into the ship file and a zero roll bias in the VCF.

Vessel 1006 has a reverse mounted RESON 8101 sonar. During a system upgrade to precise timing, ISIS software reverted back to the original factory settings, which is sonar head projected forward. Data collected on DN190 by hull 1006 was inadvertently collected with the setting projected forward. To correct data collected on this day a VCF named “1006_Reson8101_reverse_mount” was constructed to revert the data collected back to the correct orientation.⁹

B3. Data Reduction

Data reduction procedures for survey H11325 conform to those detailed in the *OPR-P182-RA-04 DAPR*.

C. VERTICAL AND HORIZONTAL CONTROL

A summary of horizontal and vertical control for this survey follows.¹⁰

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. Performance checks were not performed due to the availability of only one beacon

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 H11325.

No secondary gauges were required.

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 P182RA2004CORP.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing.¹¹ A request for delivery of final approved (smooth) tides for survey H11325 was forwarded to N/OPS1 on July 28, 2004. A copy of the request is included in Appendix IV.¹²

D. RESULTS AND RECOMMENDATIONS

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

No AWOIS Items were located within the survey limits of H11325.¹³

D.2 Chart Comparison

Survey H11325 was compared with charts:¹⁴
16011 (13th Ed.; December 2, 2000, 1:1,023,188, corrected through NTM 01/04)
16561(1st Ed.; January 20,2001, 1:80,000, corrected through NTM 44/03)
16013 (29th Ed., November 2003, 1:969,761, corrected through NTM 44/03)

Chart 16011

Depths from survey H11325 generally agreed with chart 16011 within 1 to 3 fathoms. This disagreement can be attributed to increased bottom coverage using SWMB. Significant discrepancies between charted and survey soundings were found on two occasions, and are discussed at the end of this section.¹⁵

Chart 16561

Depths from survey H11325 generally agreed with chart 16561 within 1 to 4 fathoms with bias towards deeper soundings. This disagreement can be attributed to increased bottom coverage using SWMB. Significant discrepancies between charted and survey soundings were found on two occasions, and are discussed at the end of this section.¹⁶

Chart 16013

Depths from survey H11325 disagreed with chart 16013 varying between 33 fathoms shoaler to 9 fathoms deeper. This disagreement can be attributed to increased bottom coverage using SWMB and the scale of the chart.¹⁷

All charts compared above have two charted depth sounding that significantly disagree with the data acquired:

- 1) Charted 76 fathoms (55° 49' 59.2" N 157° 53' 57.72" W)¹⁸
- 2) Charted 40 fathoms (55° 46' 47.48" N 157° 59' 39.4" W)¹⁹

Data from H11325 reveals depths at the charted 76 fathom of 43 fathoms.²⁰ Depths at the charted 40 fathoms were found to be 49 fathoms.²¹ Discrepancies can be attributed to 100% SWMB coverage in this area.

D.3 Shoreline

Shoreline Source

No shoreline verification was done for this sheet.²²

Shoreline Verification

No shoreline verification was done for this sheet.²³

Source Shoreline Changes and New Features

No Source Shoreline Changes or New Features were added for this sheet.²⁴

Charted Features

No Charted Features were changed for this sheet.²⁵

Recommendations

No Recommendations were made for this sheet.

D.4 Dangers to Navigation

No Dangers to Navigation (DTONs) were found within the limits of H11325.²⁶

D.5 Aids to Navigation

No Aids to Navigation (ATONs) are located within the limits of H11325.²⁷

D.6 Miscellaneous

No bottom samples were taken for this sheet.²⁸

E. APPROVAL

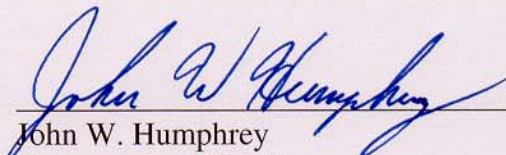
As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables,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

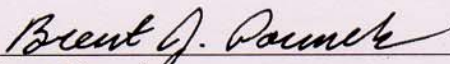
Survey H11325 is complete and adequate to supersede charted soundings in their common areas. No additional work is required for this survey.²⁹

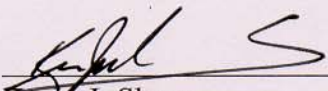
Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-P182-RA-04	Nov. 12, 2004	N/CS34

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: 
 Brent Pounds
 Ensign, NOAA

Field Operations Officer: 
 Kevin J. Slover
 Lieutenant, NOAA

Revisions Compiled During Office Processing and Certification

¹ Project Instructions set the survey scale at 1:40,000. The hydrographer received authorization to submit H11325 at 1:20,000 scale. The Field Number has been changed to RA-20-02-04. Due to spatial problems at this scale, the smooth sheet was created at 1:40,000 scale. For further information, see supplemental correspondence email dated 10 May 2005, attached to this report.

² Concur.

³ Filed with the project records.

⁴ Strikethrough ~~1016~~, replace with “1021”.

⁵ Strikethrough ~~1016~~, replace with “1021”.

⁶ Do not concur. PHB QA review of the data found the following:

“...[H11325] data acquired in water depth less than 100 meters using Elac 1050D MKII system meet depth accuracy standard of IHO order 2 but not that of order 1” and “...do not fully meet NOAA Hydrographic Surveys Specifications and Deliverables Manual Requirements for depths less than 100 meters, which conforms to IHO Order 1.”

The survey was recommended for acceptance due to the scarcity of data on the chart. H11325 junctions well with adjacent surveys, indicating the data is acceptable. The evaluator concurs with the QA reviewer in recommending that the survey supersede prior surveys and charted data from miscellaneous sources.

⁷ In PHB processing, H11325 was compared at its northeastern junction with H11464 and at its northern junction with H11465 (both OPR-P182-KR-05). All surveys compared well, generally within 1 to 3 fathoms. Data from all surveys have been considered in compiling the Hdrawing.

⁸ Strikethrough ~~119~~, replace with “191”.

⁹ Survey data is acceptable for charting.

¹⁰ Note that H11325 was the only survey completed under OPR-P182-RA-04. A Project-Wide Horizontal and Vertical Control Report was not submitted.

¹¹ Approved Tide Note dated October 13, 2004 is attached to this report.

¹² Filed with the hydrographic records.

¹³ Concur.

¹⁴ In PHB Processing, comparison was also made with continuous maintenance rasters for Chart 16011, 36th Edition, Chart 16561, 2nd Edition, and Chart 16013, 30th Edition.

¹⁵ Concur with clarification. Six charted soundings fell within the survey area.

¹⁶ Concur with clarification. Eight charted soundings fell within the survey area.

¹⁷ Concur with clarification. Six charted soundings fell within the survey area. Four charted soundings agree with surveyed soundings to within zero to four fathoms. The two charted soundings showing greater differences from survey data are discussed below.

¹⁸ Strikethrough (~~55° 49' 59.2" N 157° 53' 57.72" W~~), replace with "(55° 50' 29.16" N 158° 02' 28.88" W)".

¹⁹ Strikethrough (~~55° 46' 47.48" N 157° 59' 39.4" W~~), replace with "(55° 51' 56.22" N 157° 55' 41.01" W)".

²⁰ Tide-corrected least depth is 44 fathoms.

²¹ Tide-corrected least depth is 55 fathoms.

²² Concur.

²³ Concur.

²⁴ Concur.

²⁵ Concur.

²⁶ Concur.

²⁷ Concur.

²⁸ Concur. The charted bottom samples have been retained in green on Level 3 of the Hdrawing.

²⁹ Concur.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 13, 2004

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P182-RA-2004
HYDROGRAPHIC SHEET: H11325

LOCALITY: Vicinity of Lighthouse Rocks, SW Alaska Peninsula
TIME PERIOD: June 27 - July 27, 2004

TIDE STATION USED: 945-9450 Sand Point, Alaska
Lat. 55° 19.9'N Lon. 160° 30.3'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.988 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SWA159, SWA169, & SWA180.

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).

[Signature]

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Printed on Recycled Paper



Final tide zone node point locations for OPR-P182-RA-2004, H11325

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
SWA159	945-9450	-6	1.21
-157.966354 56.106955			
-158.249691 56.02319			
-157.900613 55.91079			
-157.130644 55.737042			
-156.94626 55.700897			
-156.893291 55.825475			
-156.806844 55.86912			
-157.007725 55.891311			
-157.439901 55.971501			
-157.846555 56.074959			
-157.966354 56.106955			
SWA169	945-9450	-6	1.18
-158.41177 56.075263			
-158.249691 56.02319			
-157.900613 55.91079			
-157.130644 55.737042			
-156.94626 55.700897			
-157.013664 55.586638			
-157.075066 55.50018			
-157.279247 55.54056			
-158.028274 55.755495			
-158.671891 55.997061			
-158.646196 56.017708			
-158.556712 56.03303			
-158.510936 56.038617			
-158.48576 56.070531			
-158.523965 56.114338			
-158.477124 56.130876			
-158.477124 56.130876			
-158.4259 56.110439			
-158.41177 56.075263			

SWA180

945-9450

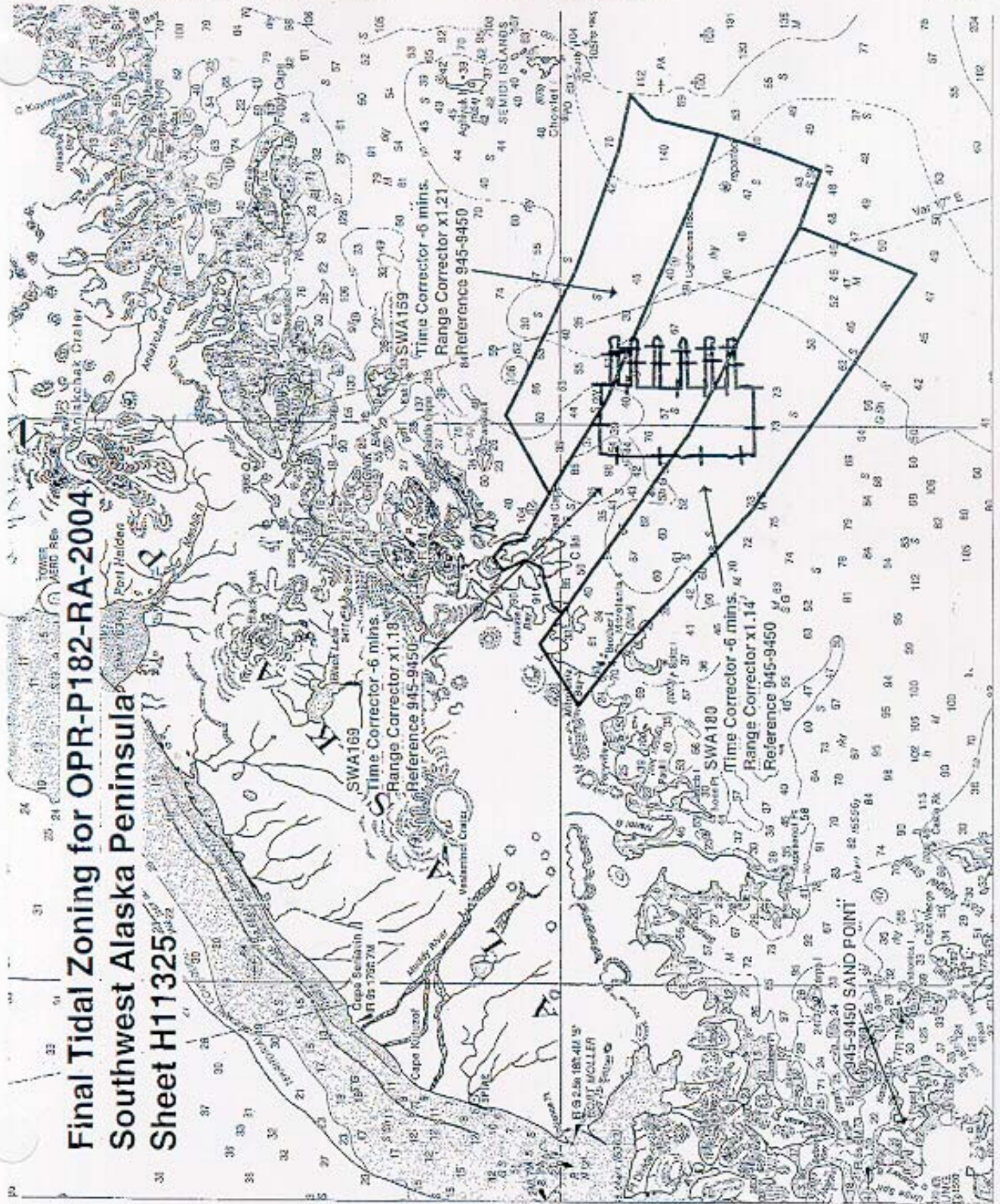
-6

1.14

-157.279247 55.54056
-158.028274 55.755495
-158.671891 55.997061
-158.786681 56.04173
-159.00679 55.967334
-158.814087 55.888574
-158.303591 55.633161
-157.449769 55.311901
-157.279247 55.54056

200

**Final Tidal Zoning for OPR-P182-RA-2004
 Southwest Alaska Peninsula
 Sheet H11325**



Subject:
H11325 Smooth Tides Applied
From:
"Edward J Van Den Ameele" <Edward.J.Vandenameele@noaa.gov>
Date:
Wed, 11 May 2005 12:26:39 -0700
To:
Brooke McMahon <brooke.mcmahon@noaa.gov>, Russ Davies
<Russ.Davies@noaa.gov>, Gary Nelson <Gary.Nelson@noaa.gov>

Smooth tides have been applied to survey H11325. BASE surfaces have been updated.
-EJ

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

Subject:survey H11325
Date:Wed, 11 May 2005 11:46:14 -0700
From:Toshihiko Uozumi <Toshihiko.Uozumi@noaa.gov>
To:Edward J Van Den Ameele <Edward.J.Vandenameele@noaa.gov>

EJ,
The new HVF file (S221_Elac1050D_HF.HVF) from the field was filed in
H11325
folder located in both "Incoming" and "Active". The email
correspondance regarding authorization of
survey scale change was filed as well.
Approved tides were applied using the new HVF file and page six of
the QA checklist has been revised to reflect the status of the survey.

Toshi

Subject:
Re: [Fwd: H11325 Quality Review]
From:
"Edward J Van Den Ameele" <Edward.J.Vandenameele@noaa.gov>
Date:
Tue, 10 May 2005 13:11:08 -0700
To:
Kyle Ward <Kyle.Ward@noaa.gov>
CC:
FOO RAINIER <foo.rainier@noaa.gov>, CO Rainier
<co.rainier@ranems.pmc.noaa.gov>, XO RAINIER <xo.rainier@noaa.gov>, Jon
Swallow <Jon.Swallow@noaa.gov>, Toshihiko Uozumi
<Toshihiko.Uozumi@noaa.gov>

Thanks for the confirmation, Kyle.

Just for the record, it is helpful for the Branch to be in this loop, or otherwise notified in the DR, just so that we know to compile the survey at the correct scale.

-EJ

Kyle Ward wrote:

LT Van Den Ameele,
During acquisition of H11325 the Operations Branch verbally approved the RAINIER's request to submit the survey as 1:20K rather than a 1:40K. This decision was made when it became clear the RAINIER would not be able to complete the entire sheet.

Regards,
Kyle

FOO RAINIER wrote:

Kyle,

Here's the QA review for H11325. Note the request for documentation of program authorization to change the scale of the survey from 1:40k to 1:20k. As we discussed yesterday, if you could ask Jon to draft an email for the record stating that this agreement was reached verbally in discussions between Ops and the Chief of Party during field work last year, that would probably suffice.

Thanks,

Ben

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

Subject: H11325 Quality Review
Resent-Date: Thu, 28 Apr 2005 16:10:02 GMT
Resent-From: FOO.Rainier@noaa.gov
Date: Thu, 28 Apr 2005 09:09:44 -0700
From: Edward J Van Den Ameele Edward.J.Vandenameele@noaa.gov
To: CO Rainier co.rainier@noaa.gov, XO Rainier xo.rainier@noaa.gov,
FOO RAINIER foo.rainier@noaa.gov
CC: Don Haines Don.Haines@noaa.gov, Toshihiko Uozumi Toshihiko.Uozumi@noaa.gov, Kim Sampadian Kim.Sampadian@noaa.gov, Gary Nelson Gary.Nelson@noaa.gov, Brooke McMahon brooke.mcmahon@noaa.gov, Russ Davies Russ.Davies@noaa.gov, Gerd Glang Gerd.Glang@noaa.gov, Mark VanWaes Mark.Vanwaes@noaa.gov, Jon Swallow Jon.Swallow@noaa.gov, Mike Gibson Mike.Gibson@noaa.gov

The Quality Assurance Review for Hydrographic Survey H11325 OPR-P182-RA-04 has been completed. The survey review checklist and survey certification memo are attached. This survey will be certified to move on to the next phase of office processing once the following additional information is received from RAINIER:

- HVF for S221_Elacl050D_HF with roll bias values for DN 179, 190 and 191

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

Subject:Re: [Fwd: H11325 Quality Review]
Date:Tue, 10 May 2005 15:12:32 -0400
From:Kyle Ward <Kyle.Ward@noaa.gov>
Organization:Hydrographic Survey Division
To:FOO RAINIER <foo.rainier@noaa.gov>
CC:CO Rainier <co.rainier@ranems.pmc.noaa.gov>, XO RAINIER
<xo.rainier@noaa.gov>, Edward J Van Den Ameele
<Edward.J.Vandenameele@noaa.gov>, Jon Swallow
<Jon.Swallow@noaa.gov>
References:<4280C98C.8070005@noaa.gov>

LT Van Den Ameele,
During acquisition of H11325 the Operations Branch verbally approved the RAINIER's request to submit the survey as 1:20K rather than a 1:40K. This decision was made when it became clear the RAINIER would not be able to complete the entire sheet.
Regards,
Kyle

FOO RAINIER wrote:

Kyle,
Here's the QA review for H11325. Note the request for documentation of program authorization to change the scale of the survey from 1:40k to 1:20k. As we discussed yesterday, if you could ask Jon to draft an email for the record stating that this agreement was reached verbally in discussions between Ops and the Chief of Party during field work last year, that would probably suffice.
Thanks,
Ben

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

Subject: H11325 Quality Review
Resent-Date: Thu, 28 Apr 2005 16:10:02 GMT
Resent-From: FOO.Rainier@noaa.gov
Date: Thu, 28 Apr 2005 09:09:44 -0700
From: Edward J Van Den Ameele <Edward.J.Vandenameele@noaa.gov>
To: CO Rainier <co.rainier@noaa.gov>, XO Rainier <xo.rainier@noaa.gov>, FOO RAINIER <foo.rainier@noaa.gov>
CC: Don Haines <Don.Haines@noaa.gov>, Toshihiko Uozumi <Toshihiko.Uozumi@noaa.gov>, Kim Sampadian <Kim.Sampadian@noaa.gov>, Gary Nelson <Gary.Nelson@noaa.gov>, Brooke McMahon <brooke.mcmahon@noaa.gov>, Russ Davies <Russ.Davies@noaa.gov>, Gerd Glang <Gerd.Glang@noaa.gov>, Mark VanWaes <Mark.Vanwaes@noaa.gov>, Jon Swallow <Jon.Swallow@noaa.gov>, Mike Gibson <Mike.Gibson@noaa.gov>

The Quality Assurance Review for Hydrographic Survey H11325 OPR-P182-RA-04 has been completed. The survey review checklist and survey certification memo are attached. This survey will be certified

to move on to the next phase of office processing once the following additional information is received from RAINIER:

- HVF for S221_Elac1050D_HF with roll bias values for DN 179, 190 and 191
- Correspondence or explanation confirming the change of survey scale from 1:40K to 1:20K

Please refer to the attached checklist and certification memo for additional information.

HSTP and HSD should take note of ongoing performance and data accuracy issues with RAINIER's SeaBeam/Elac 1050D. Data acquired for this survey using the Elac are considered no better than IHO Order 2, which for depths less than 100 meters does not meet NOAA depth accuracy requirements.

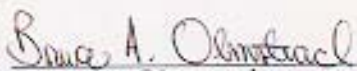
--

LT Ben Evans, NOAA
Field Operations Officer
NOAA Ship RAINIER (s221)
NOAA Marine Operations Center, Pacific
1801 Fairview Ave. E
Seattle, WA 98102

APPROVAL SHEET
H11325

Initial Approvals:

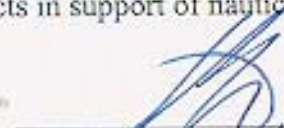
The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where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



Bruce A. Olmstead
Cartographic Team
Pacific Hydrographic Branch

Date: 10/18/2006

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
CDR, NOAA
Chief, Pacific Hydrographic Branch

Date: 19 Oct. 2006

