

D00148

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.

Registry No. D00148

LOCALITY

State Alaska

General Locality Bering Sea

Sublocality Eastern Bering Sea and Bristol Bay

2009

CHIEF OF PARTY

..... CAPT David O. Neander, NOAA

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72) <div style="text-align: center; margin-top: 10px;"> U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION </div> <div style="text-align: center; margin-top: 20px;"> HYDROGRAPHIC TITLE SHEET </div>	REGISTRY No <div style="text-align: center; font-size: 1.2em; font-weight: bold;">D00148</div>
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 <u>Alaska</u>	
General Locality <u>Bering Sea</u>	
Sub-Locality <u>Eastern Bering Sea and Bristol Bay</u>	
Scale <u>1:500,000</u> Date of Survey <u>July 27 to August 5, 2009</u>	
Instructions dated <u>7/7/2009</u> Project No. <u>OPR-M-R908-FA-09</u>	
Vessel <u>NOAA Ship FAIRWEATHER</u>	
Chief of party <u>CAPT David O. Neander, NOAA</u>	
Surveyed by <u>FAIRWEATHER Personnel</u>	
Soundings by echo sounder, hand lead, pole <u>Reson 8111, Reson 8160</u>	
Graphic record scaled by <u>N/A</u>	
Graphic record checked by <u>N/A</u> Automated Plot <u>N/A</u>	
SAR by <u>Keith Toepfer</u> Compilation by <u>Keith Toepfer</u>	
Soundings in <u>Fathoms</u> at <u>MLLW</u>	
REMARKS: <u>All times are UTC. UTM Projection 03N</u>	
<u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS)</u>	
<u>nautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were</u>	
<u>generated during office processing. Page numbering may be interrupted or non sequential.</u>	



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
NOAA Ship FAIRWEATHER S-220
1010 Stedman Street
Ketchikan, AK 99901

October 5, 2009

MEMORANDUM FOR: Gary Nelson, NOAA
Chief, Pacific Hydrographic Branch

FROM: CAPT David O. Neander, NOAA
Commanding Officer

David O. Neander
2009.10.16
09:20:29 -08'00'

TITLE: Approval of Chart Letter for D00148,
M-R908-FA-09

As Chief of Party, I submit the following soundings as adequate to supersede charted data in their common areas. All data are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

I acknowledge that all of the information contained in this chart letter is complete and accurate to the best of my knowledge.

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

Briana Welton

Digitally signed by Briana Welton
DN: cn=Briana Welton, c=US, o=NOAA,
ou=NOAA S/V BAY HYDROGRAPHER
email=briana.welton@noaa.gov
Reason: I have reviewed this document
Date: 2009.10.15 20:12:13 -08'00'

ST Weston Renoud
Survey Manager

Digitally signed by Matthew
Ringel
Date: 2009.10.16 09:05:13 -08'00'

LT Matthew Ringel
Field Operations Officer

Attachment



Chart Letter to Accompany Hydrographic Survey D00148

Project M-R908-FA-09

Bristol Bay, Alaska

Scale 1:500,000

July - August 2009

NOAA Ship *Fairweather*

Chief of Party: Captain Douglas D. Baird, Jr., NOAA

The survey area was located in Bering Sea and Bristol Bay, AK. This survey corresponds to Sheet A in the sheet layout provided with the Project Instructions. Track-line coverage is shown in Figure 1 below.

Data acquisition was conducted from July 27 to August 5, 2009 (day number 208 to 217).

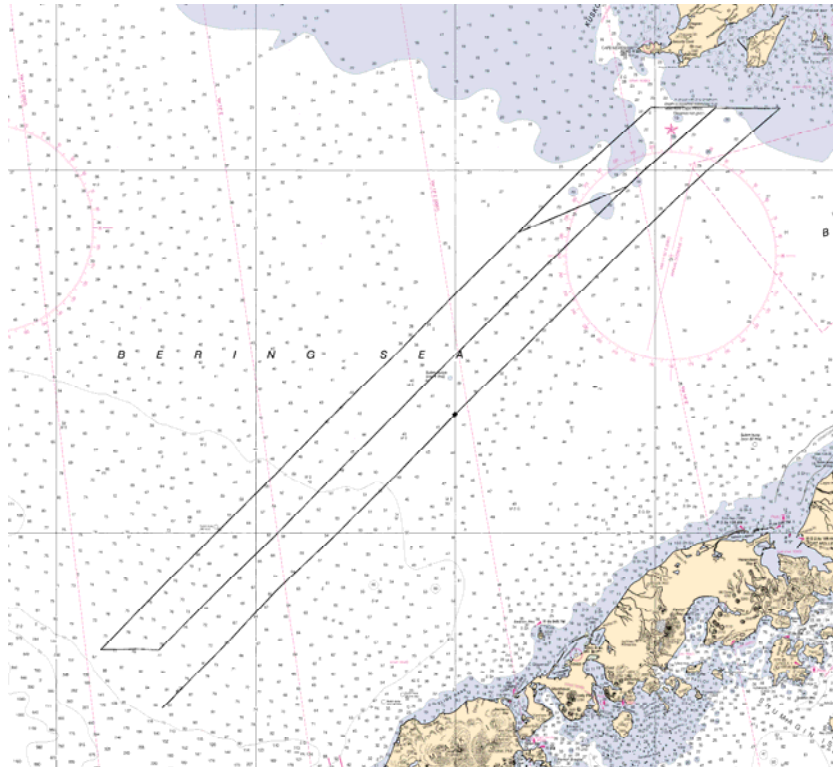


Figure 1

Positioning was corrected during acquisition using the StarFire satellite-based augmentation system. The data was collected in the World Geodetic System of 1984 (WGS84) reference frame but for the purposes of charting the horizontal datum can be considered North American Datum of 1983 (NAD83).

Zoned tides based on verified tides were applied where available using the following gauges: Unalaska, Dutch Harbor, AK (946-2620); Port Moller, Bristol Bay, AK (946-3502); and Village Cove, St. Paul Island, AK (946-4212). Verified single station tides from tide gauge Unalaska, Dutch Harbor, AK (946-2620) were applied for the remaining data. An offset of approximately 1 meter was seen at the boundary between application of zoned and single station tides.

Additional correctors applied in post processing include sound velocity profiles to account for refraction, dynamic draft and POS/MV TrueHeave.

Data were collected simultaneously with the RESON 8111 and RESON 8160 multibeam systems. A 16 meter CUBE surface based on the RESON 8111 data were used to generate soundings for comparison with the chart.

Charts affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)
16011	37th	11/1/2007	1:1,023,188 (16011_1)	NGA NTM: 03/15/2008 (04/12/2008)
				USCG LNM: 05/12/2009 (05/26/2009)
16006	35th	4/1/2008	1:1,534,076 (16006_1)	NGA NTM: 10/13/2007 (05/30/2009)
				USCG LNM: 01/13/2009 (05/26/2009)
513	7th	6/1/2004	1:3,500,000 (513_1)	NGA NTM: 12/13/2003 (05/30/2009)
				USCG LNM: 01/13/2009 (05/26/2009)
500	8th	6/1/2003	1:3,500,000 (500_1)	NGA NTM: 01/17/2009 (05/30/2009)

Recommendation

The following soundings on chart 16011 were within 4mm at survey scale (2000 meters) of a shoaler sounding. Charted soundings should be updated with soundings from survey D00148 in their common area, as listed below¹.

Position		Depth (fathoms)	
Latitude	Longitude	Charted	Surveyed
55° 01' 09.1" N	166° 51' 48.3" W	85	82
55° 10' 20.1" N	166° 41' 32.5" W	79	76
55° 19' 31.9" N	167° 13' 35.2" W	79	76
55° 22' 03.2" N	166° 56' 40.8" W	78	75
55° 27' 53.7" N	166° 42' 26.4" W	76	73
55° 34' 45.0" N	165° 53' 46.1" W	67	65
55° 36' 27.7" N	167° 03' 38.0" W	75	73
55° 39' 07.1" N	165° 51' 35.1" W	65	64
55° 46' 49.5" N	165° 37' 47.6" W	64	62
56° 14' 08.5" N	164° 45' 14.3" W	51	48
56° 15' 50.0" N	165° 53' 33.2" W	53	51
56° 18' 59.4" N	164° 33' 54.9" W	49	47
56° 21' 21.9" N	165° 08' 14.8" W	48	46
56° 27' 25.1" N	165° 01' 51.6" W	45	44
56° 37' 33.9" N	165° 17' 19.3" W	43	41
56° 42' 40.7" N	165° 08' 41.0" W	42	40
56° 47' 47.3" N	165° 02' 12.7" W	42	40
56° 52' 02.1" N	164° 16' 54.6" W	40	38
57° 06' 26.5" N	163° 10' 51.1" W	35	33
57° 09' 30.6" N	163° 06' 47.3" W	33	31
57° 12' 55.3" N	163° 02' 20.8" W	32	29
57° 20' 00.5" N	163° 23' 28.5" W	30	28
58° 00' 57.3" N	162° 05' 04.1" W	21	19

Submission

Raw HSX, snippet 81X, HDCS Data, corrector files, and supporting documents are submitted digitally. Fieldsheets and surfaces are not included in the digital submission package.

Revisions Compiled During Office Processing and Certification

¹ Concur with clarification. In addition to concurring that the 23 soundings identified should be used to update the existing chart, additional soundings in the survey were found which the compiler recommends be used to update the chart. These additional soundings include: (a) soundings which were shoaler than, and located within 4mm at survey scale of, charted soundings and are recommended to replace the latter; (b) new soundings located in areas lacking sufficient sounding density; and (c) one sounding which will replace an existing charted sounding within the common area of the chart and survey. A table of all soundings additional to those tabulated in the Chart Letter is included as a table in the D00148 HCell Report.

D00148 HCell Report
Keith Toepfer, 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's and RNC's in the region: NOAA RNCs, 16011 (1:1,023,188), 16006 (1:1,534,076), 513 (1:3,500,000) and 500 (1:3,500,000), and corresponding NOAA ENC, US5AK5FM, (See section 4. Meta Areas.)

HCell compilation of survey D00148 utilized Office of Coast Survey DRAFT HCell Specifications Version 4.0. For additional information on the standards and protocols used for HCell Compilation, see the DRAFT A/PHB HCell Reference Guide, version 2.0, 26 March, 2010.

1. Compilation Scale

Depths and features for HCell D00148 were compiled to the largest scale chart in the region, 16011, 1:023,188. (See section 4. Meta Areas.)

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 16-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1:500,000 survey scale using a Radius Table file with values shown in the table, below. The resultant sounding layer contains 1,765 depths ranging from 18.497 to 154.909 meters.

Shoal Limit (m)	Deep Limit (m)	Radius (mm)
10	20	4
20	50	4.5
50	500	5

In CARIS BASE Editor, soundings were manually selected from the high density sounding layer and imported into a new layer created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology. Because full compliance with NOS survey specifications could not be conclusively verified, selection of soundings for compilation to the chart was limited to two cases: (1) those soundings in the *_SS data set which are within 4mm at survey scale of, and shoaler than, a currently charted sounding, and (2) those soundings in the *_SS data set the addition of which will fill gaps where currently charted soundings are substantially more widely spaced than is generally the case on the chart. A table of soundings additional to those identified in the field-submitted chart letter, in a format similar to that in the chart letter is appended to this HCell Report. All soundings recommended to be superseded are indicated by Bluenote in the HCell. One sounding is recommended to be retained as charted and is marked by Bluenote.

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

Chart Contour Intervals in Fathoms from Chart 16011	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on D00148_SS.000
20	36.576	37.948	20.750	20
50	91.440	92.812	50.750	50

Neither shoreline nor non-sounding features were submitted by the field nor found by the compiler within the boundaries of the survey.

4. Meta Areas

The following Meta object areas are included in HCell D00148:

M_QUAL

Meta area objects were constructed on the basis of the limits of the hydrography, simplified to reduce the number of nodes to permissible levels without eliminating areas of hydrography. (See 3.1 *Depth Contours*.)

5. Features

5.1 Generalization of Features to Chart Scale

No features other than soundings were present within the limits of hydrography of survey D00148.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes
M_QUAL	Data quality Meta object
SOUNDG	Soundings at the chart scale density

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. 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):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

Sounding Units:	Meters rounded to the nearest millimeter
Spot Height Units:	Meters rounded to the nearest decimeter

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

Conversion to fathom charting units with NOAA rounding ensures that:

- All depths deeper or equal to 11 fathoms display as whole fathoms.
- All depth units between 0 fathoms (MLLW) and 11 fathoms display as fathoms and whole feet.
- All depth units above 0 fathoms (MLLW) to 2.0 feet above MHW display in feet for values that round to 5 feet or less, and in fathoms and feet above that. (This is a deviation from the traditional 'fathoms and feet' charting rule that requires that all depths above MLLW will be

shown in feet. The display in fathoms and feet for depths between MLLW and 2 feet above MHW accommodates S-57 rules that require the same charting units to be used for all depth units (DUNI) in an ENC.)

- All height units (HUNI) which have been converted to charting units, and that are 2.00 feet above MHW and greater, are shown in feet.

In an ENC viewer fathoms and feet depth units (DUNI) display in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. In an ENC viewer, heights (HUNI) display as whole feet.

9. Data Processing Notes

9.1 Junction Surveys

D00148 does not junction with any contemporary surveys.

9.2 Conflicts between Shoreline and Hydrography

No shoreline is present within the boundaries of the survey.

10. QA/QC and ENC Validation Checks

D00148 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

D00148_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:023,188
D00148_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:500,000
D00148_DR.doc	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
D00148_outline.gml	Survey outline to populate SURDEX
D00148_outline.xsd	

11.3 Software

CARIS HIPS Ver. 6.2	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. 2.1	Final compilation of the HCell, correct

	geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1	Validation of the base cell file.
Newport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

Keith Toepfer
Physical Scientist
Pacific Hydrographic Branch
Seattle, WA
206-526-6877
Keith.Toepfer@noaa.gov.

Additional Soundings Found During Compilation

Position		Depth (fathoms)		Comment(s)
Latitude	Longitude	Charted	Surveyed	
55° 22' 31.04" N	166° 16' 35.24" W	69	69	Replacement <i>in situ</i>
55° 52' 04.80" N	165° 25' 46.70" W	57	56	New - shoaler
55° 58' 01.66" N	165° 14' 42.56" W	54	52	New - shoaler
56° 01' 09.92" N	166° 21' 57.50" W	65	--	In common area. Retain as charted.
56° 05' 39.65" N	166° 13' 54.23" W	63	62	New - shoaler within 4mm @ survey scale
56° 07' 32.31" N	164° 57' 32.14" W	51 & 52	50	New - shoaler
56° 36' 05.64" N	164° 42' 54.97" W	--	41	New
56° 40' 35.46" N	164° 34' 56.33" W	--	40	New
56° 53' 01.09" N	164° 49' 01.57" W	--	38	New
56° 58' 26.31" N	164° 38' 54.51" W	--	37	New
57° 16' 22.41" N	164° 06' 46.22" W	--	34	New
57° 23' 52.08" N	163° 52' 43.39" W	--	30	New
57° 29' 32.01" N	163° 41' 52.95" W	--	26	New
57° 36' 12.99" N	163° 29' 24.08" W	--	25	New
57° 42' 07.56" N	162° 41' 00.87" W	--	23	New
57° 45' 46.26" N	161° 56' 52.45" W	26	25	New - shoaler
58° 03' 25.60" N	162° 37' 53.79" W	21	20	New - shoaler within 4mm @ survey scale
58° 19' 59.48" N	161° 21' 38.57" W	--	16	New
58° 21' 09.89" N	161° 40' 58.93" W	--	19	New

APPROVAL SHEET
D00148

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproof of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

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