

H11489

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. H11489

LOCALITY

State Alaska

General Locality Shumagin Islands

Sublocality South and East of Mountain Point

2005

CHIEF OF PARTY

..... Captain John E. Lowell, Jr., NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11489

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 AlaskaGeneral Locality Shumagin IslandsSublocality South and East of Mountain PointScale 1:20,000Date of Survey June 28, 2005-August 15, 2005Instructions Dated 5/13/2005Project No. OPR-P183-FA-05Vessel NOAA Ship FAIRWEATHERChief of Party CAPT John E. Lowell, Jr., NOAASurveyed by ENS Gonsalves, CST Morgan, LT WetzlerSoundings taken by echo sounder RESON 8111ERGraphic record scaled by N/AGraphic record checked by N/AEvaluation by P. Holmberg Automated plot by HP Designjet 1050CVerification by P. Holmberg, K. ReserSoundings in Fathoms and Feet at MLLWREMARKS: Time in UTC. UTM Projection Zone 4

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

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

All separates are filed with the hydrographic data.

Descriptive Report to Accompany Hydrographic Survey H11489

Project OPR-P183-FA
Shumagin Islands and Vicinity, Alaska

Scale 1:20,000

June - August 2005

NOAA Ship FAIRWEATHER

Chief of Party: Captain John E. Lowell, Jr., NOAA

A. AREA SURVEYED

The survey area was located in Shumagin Islands, within the sub-locality of South and East of Mountain Point. This survey corresponds to Sheet R in the sheet layout provided with the Letter Instructions and Letter Instructions Change No. 1 dated July 14, 2005, as shown in Figure 1 below. The survey area is bounded on the Southwest corner at 54°43'25"N, 160°16'15"W and the Northeast corner at 54°53'00"N, 159°50'25"W.

Data acquisition was conducted from June 28 to August 15, 2005 (DN 179 to DN 227).

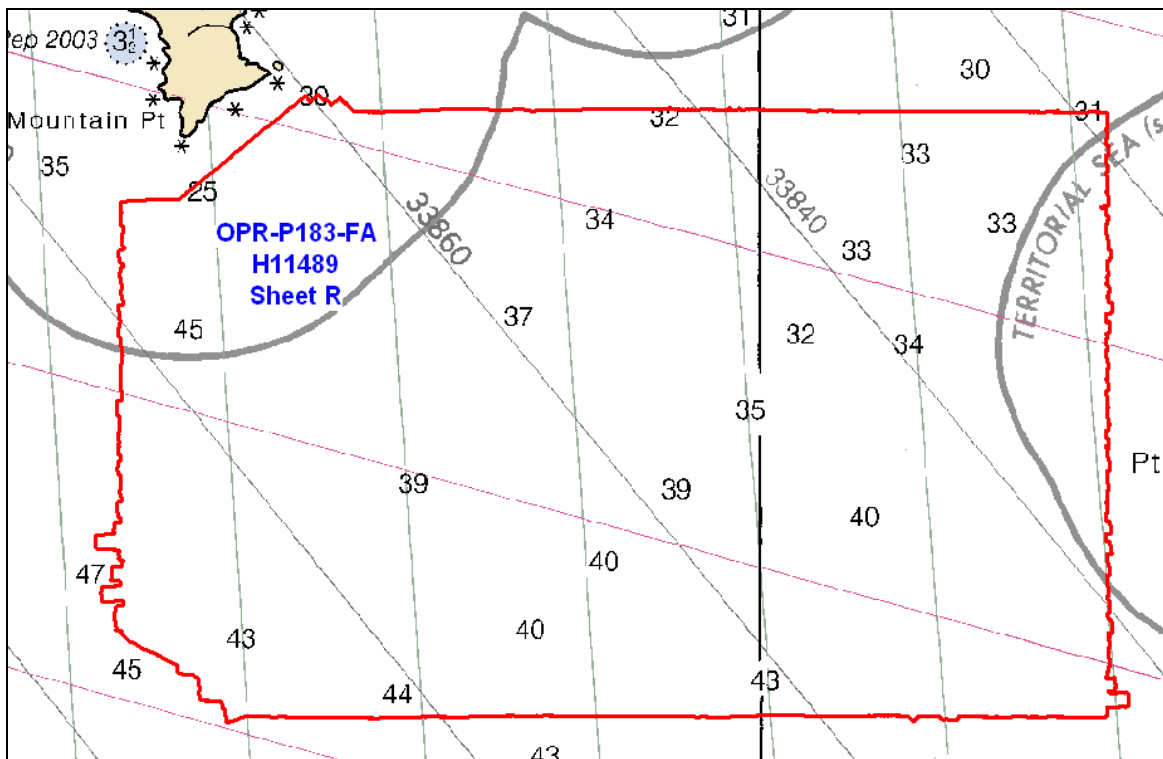


Figure 1: H11489 Survey Outline

One hundred percent multibeam echosounder (MBES) coverage was obtained within the survey limits.¹ Additional coverage was obtained in order to determine least depths over features or shoals.

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition and processing systems and survey vessels can be found in the *NOAA Ship FAIRWEATHER Hydrographic Systems Certification Report 2005*, submitted under a separate cover. Quality control procedures and data processing methods are listed and described in the *OPR-P183-FA-05 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.

B1. Equipment and Vessels

Equipment and vessels used for data acquisition and survey operations during this survey are listed below in Table 1.

	FAIRWEATHER
Hull Registration Number	S220
Builder	Aerojet-General Shipyard
Length Overall	231 feet
Beam	42 feet
Draft, Maximum	15' 6"
Cruising Speed	12.5 knots
Max Survey Speed	10 knots
Primary Echosounder	RESON 8111 & RESON 8160
Sound Velocity Equipment	SBE 19plus & 45, MVP 200
Attitude & Positioning Equipment	POS/MV V3
Type of operations	MBES, Bottom Samples

Table 1: Vessel Inventory

No vessel configurations used during data acquisition deviated from the DAPR.

B2. Quality Control

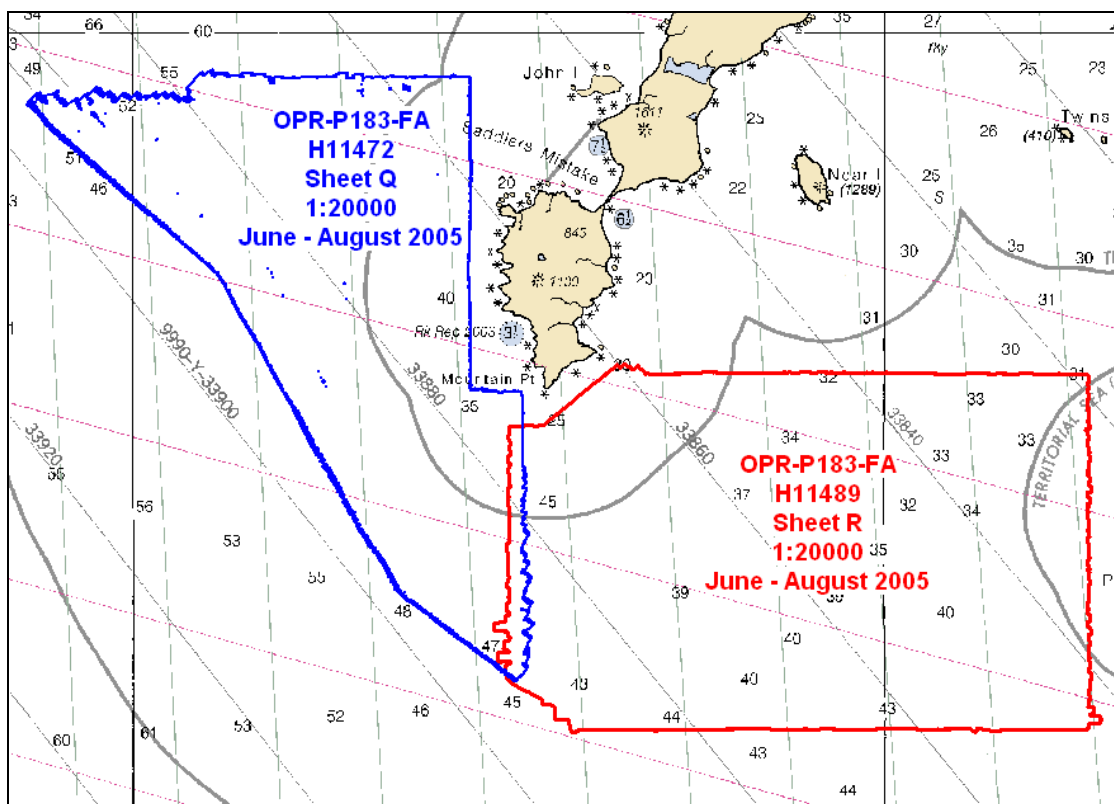
Crosslines

Shallow water multibeam crosslines for this survey totaled 49.6 linear nautical miles (lnm), comprising 5.1% of the 961.1 lnm of total SWMB hydrography.

The Hydrographer has determined, through manual examination of the data, that the crossline agreement with main scheme data meet the vertical accuracy requirements as stated in the *NOS Hydrographic Surveys Specifications and Deliverables*.³

Junctions

Survey H11489 junctions with H11472, which is Sheet Q of the same project. The area of overlap between the sheets was approximately 500 meters wide. Data were reviewed in CARIS Subset Editor for consistency and data were found to be consistent between the surveys, meeting the requirements as stated in the *NOS Hydrographic Surveys Specifications and Deliverables*.⁴ The survey outlines and area of overlap for Sheets R and Q are shown in Figure 2.



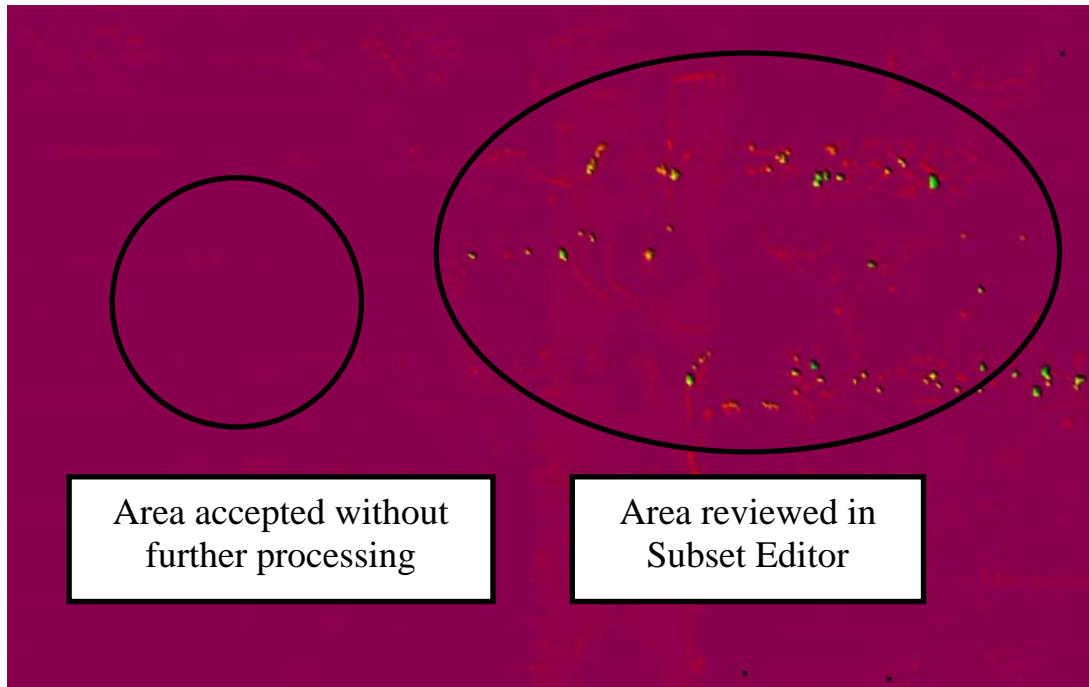


Figure 3: Standard Deviation layer showing areas requiring further cleaning in CARIS Subset Editor

Data Quality Factors

COVERAGE ASSESSMENT:

Coverage assessment was determined using the following BASE surface resolutions listed in Table 2.

Depth Ranges (m)		Resolution (m)
Low	High	
40	55	3
50	70	4
65	180	5

Table 2: Depth Ranges and Resolutions

When using the above resolutions, derived from maintaining an 8% of water depth resolution or better, a few small gaps in the BASE surfaces were still detected. These gaps were rarely more than two nodes across for a given resolution (two nodes in a 4-meter resolution surface would measure 8 meters across). However, given the flat bathymetry of H11489, the presence of these sparse holes are not likely to conceal any significant features.⁵

TRUEHEAVE:

The initial application of TrueHeave data to H11489 caused an accordion-like artifact to the BASE surfaces. Additionally, data viewed in CARIS Subset Editor, as shown in Figure 4, displayed periodic tendencies with an amplitude exceeding 1 meter – suggestive of a heave-related error. The removal of TrueHeave from H11489 resulted in smoother surfaces and survey lines that no longer jounced across the sea floor. Figure 5 shows a clear improvement in the MBES data integrity; therefore, TrueHeave data has

not been applied to H11489. Given the survey lines of H11489 are straight with minimal turning, the lack of TrueHeave is unlikely to affect the MBES data quality.⁶

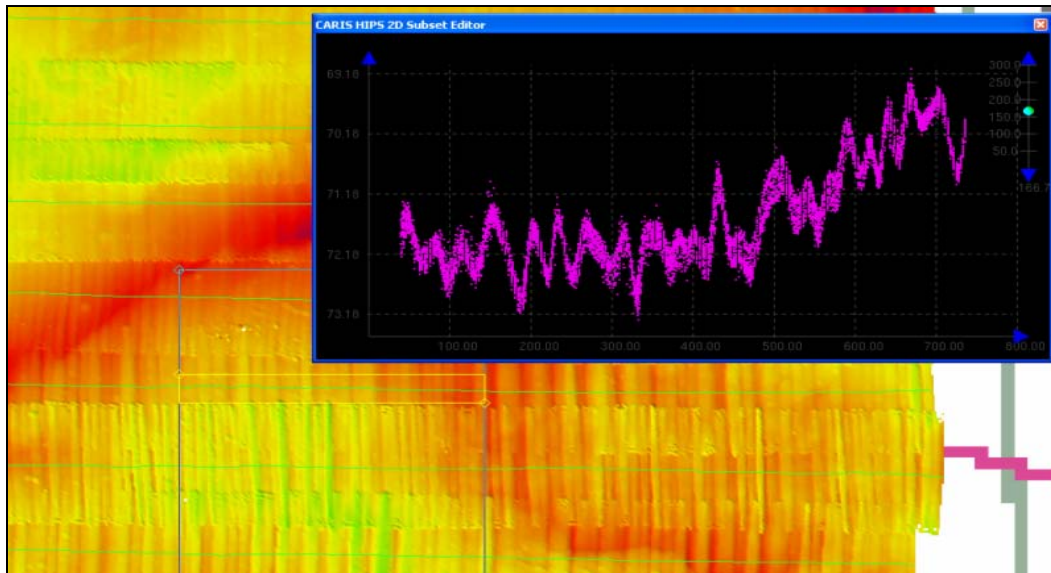


Figure 4: H11489 data with the application of TrueHeave

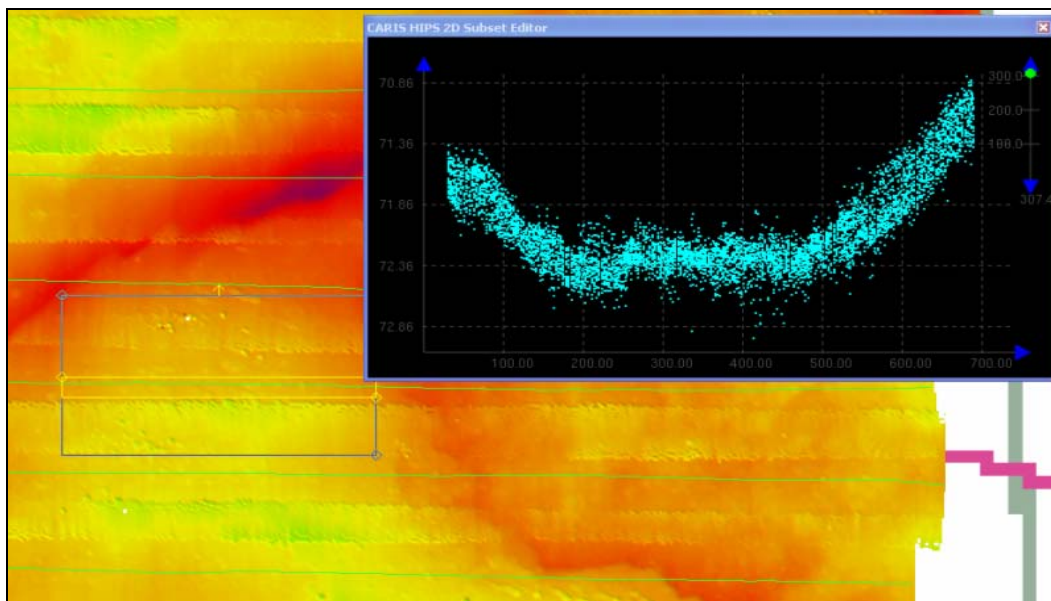


Figure 5: H11489 data after TrueHeave was removed

SOUND VELOCITY:

The survey area of H11489 had a relatively flat bottom and a dynamic water column. Despite increasing the interval of sound velocity casts to nearly continuous using the ship's Moving Velocity Profiler (MVP), there continued to be sound velocity issues in the outer beam data; however, the data are within NOAA HSSDM specifications.⁷

For S220_8111, the individual BOT files were directly concatenated to the ship .svp file for the project and applied to multibeam data in CARIS HIPS during data processing. No individual .svp files exist for each cast taken by the MVP due to the large number of casts acquired.

Accuracy Standards

All data meet the data accuracy specifications as stated in the *NOS Hydrographic Surveys Specifications and Deliverables*, dated March 2003.⁸

B3. Corrections to Echo Soundings

Data reduction procedures for survey H11489 conform to those detailed in the of the *OPR-P183-FA-05 Data Acquisition and Processing Report*, or as discussed below.⁹

C. HORIZONTAL AND VERTICAL CONTROL

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 the U.S. Coast Guard beacon at Cold Bay (289 kHz) were utilized during this project.

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 H11489.

All data were reduced to MLLW using verified tides downloaded from the CO-OPS website for station Sand Point, AK by applying tide file 9459450.tid and time and height correctors through the revised zone corrector file P183FA2005CORP.zdf.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing.¹⁰ A request for delivery of final approved (smooth) tides for survey H11489 was forwarded to N/OPS1 on August 22, 2005 in accordance with the Preliminary Field Procedures Manual v1.1, dated March 2005 (FPM). A copy of the request is included in Appendix 3.

FAIRWEATHER received the Tide Note for Hydrographic Survey H11489 on November 3, 2005. The Tide Note for Hydrographic Survey H11489 states that preliminary zoning is accepted as the final zoning correctors. Verified water level data were received by the FAIRWEATHER on November 10, 2005 for NWLON primary tide station at Sand Point, AK (945-9450). The Tide Note for Hydrographic Survey H11472 and ancillary correspondence are included in Appendix 4.¹¹ The verified water level data (smooth tides) is submitted with the data.

Verified water level data (smooth tides) were not applied by the FAIRWEATHER. It will be necessary for the Pacific Hydrographic Branch to apply the verified water level data (smooth tides) to the survey data during final processing.¹²

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

The 5 meter resolution BASE surface was brought into Pydro by means of the Insert BASE/Weighted Grids function. The BASE surface soundings were then excessed to survey scale and shoal biased. The affected charts in the survey area were brought into Pydro. The Hydrographer manually compared the charted soundings to the shoal biased, excessed BASE soundings in the Chart window.

Survey H11489 was compared with charts 16540 (12th Ed; January 1, 2005, 1:300,000) and 16006 (33rd Ed.; December 23 2000, 1:1,534,076). Chart 16540 had been updated with the Notice to Mariners through January 28, 2006; Chart 16006 had been updated with the Notice to Mariners through January 21, 2006.

Chart 16540

Depths from survey H11489 generally agreed within one to two fathoms with depths on chart 16540.¹³

Chart 16006

There were only two charted soundings in the survey area. Depths from survey H11489 agreed within one to two fathoms of both soundings on chart 16006.¹⁴

Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy is as discussed in the Accuracy Standards portion of this report. The BASE surfaces and associated soundings are adequate to supersede prior surveys in their common areas.¹⁵ Final chart comparisons will be made at the Pacific Hydrographic Branch after the application of smooth tides.¹⁶

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H11489.¹⁷

Dangers to Navigation

There were no dangers to navigation found within the survey limits.¹⁸

D.2 Additional Results

Shoreline Verification

There was no shoreline data within the survey limits.¹⁹

Aids to Navigation

There were no aids to navigation within the survey limits.²⁰

Bottom Samples

Bottom samples were collected on August 14, 2005 (DN 226). The Field Procedures Manual specifies the distance between bottom samples should be 2000 meters. Due to the large area covered by survey H11489, approval was obtained from HSD to increase the distances between bottom samples to 4000 to 5000 meters, diverging from specifications. Correspondence concerning the increased distance between bottom samples can be found in Appendix IV, Supplemental Correspondence.²¹ The bottom samples are included as seabed classifications, along with the other S57 features in the Pydro Preliminary Smooth Sheet. The bottom sample positions were also imported to the Notebook H11489_Add_Pydro.hob file.²²

E. Supplemental Reports

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>
Hydrographic Systems Certification Report 2005	April 18, 2005	N/CS34
OPR-P183-FA-05 Data Acquisition and Processing Report	November 15, 2005	N/CS34
OPR-P183-FA-05 Horizontal & Vertical Control Negative Report	August 22, 2005	N/CS34, N/OPS1



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

June 14, 2006

MEMORANDUM FOR: CDR Don Haines, NOAA
Chief, Pacific Hydrographic Branch

FROM: *for* CAPT John E. Lowell, Jr, NOAA *J. V. Morgan*
Commanding Officer

TITLE: Approval of Hydrographic Survey H11489,
OPR-P183-FA

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11489 in accordance with the Hydrographic Manual, Fourth Edition; Hydrographic Survey Guidelines; Field Procedures Manual, March 2005 Version 1.1; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for March, 2003. Additional guidance was provided by applicable Hydrographic Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

I acknowledge that all of the information contained in this report 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:

ENS Michael O. Gonsalves
Survey Manager

CST Lynnette V. Morgan
Chief Survey Technician

Attachment



Revisions Compiled During Office Processing and Certification

¹ Concur.

² Filed with project records.

³ Concur.

⁴ Concur.

⁵ Concur.

⁶ Concur. Data meets specifications.

⁷ Concur with clarification. The effect of the SV errors on the BASE surfaces are within IHO specifications.

⁸ Concur. These data are adequate to supersede charted data in the common area.

⁹ Concur.

¹⁰ Final approved water levels were applied to all data during the survey acceptance review.

¹¹ See attached Tide Note dated October 31, 2005.

¹² Final approved water levels were applied to all data during the survey acceptance review.

¹³ Concur.

¹⁴ Concur.

¹⁵ Concur.

¹⁶ Final chart comparisons agree with field comparisons.

¹⁷ Concur.

¹⁸ Concur.

¹⁹ Concur.

²⁰ Concur.

²¹ See attached correspondence regarding bottom sample intervals.

²² All bottom samples collected are included in the HCell. There were no charted bottom samples within the limits of H11489 to be retained or superseded.

Subject: Re: Bottom Samples
Resent-Date: Fri, 12 Aug 2005 20:51:41 GMT
Resent-From: ChiefST.Fairweather@noaa.gov
Date: Fri, 12 Aug 2005 16:51:34 -0400
From: "Michael Riddle" <Michael.Riddle@noaa.gov>
Organization: NOAA/NOS
To: foo.fairweather <foo.fairweather@noaa.gov>,
Jon Swallow <Jon.Swallow@noaa.gov>,
"Holly A. Dehart" <Holly.A.Dehart@noaa.gov>,
_NMAO_MOP_ChiefST_Fairweather <ChiefST.Fairweather@noaa.gov>,
_NMAO_MOP_CO_Fairweather <CO.Fairweather@noaa.gov>,
Jennifer Sherry <Jennifer.Sherry@noaa.gov>,
Doug Baird <Doug.Baird@noaa.gov>

Jon agrees. 4000m to 5000m works for us

"Michael.Riddle" wrote:

>
> Jon / Mark,
> The Prelim March 2005 FPM states "At a very minimum, the hydrographer
> should obtain samples at the charted sediment locations". I would think
> that for the reasons stated below and since the largest chart 18540
> (1:300,000) has no bottom samples, that 4000 - 5000m spacing would be
> adequate. Agree Jon?
> Mike
>
> foo.fairweather wrote:
> >
> > Jon,
> >
> > Ahh, the weather out here in the Shumagins is beautiful. Wish you were
> > out here to enjoy it with us. We are just about done with all of the
> > inshore sheets and shifting operations toward ship's hydro on the
> > 1:20,000 scale sheets Q and R. Q has another day or so of ship hydro
> > work for MB acquisition to be completed and the bottom samples still
> > have to be run.
> >
> > To the crux of the email: Using the standards specified in the NHSSD or
> > the FPM (2000 m spot spacing for bottom samples in non anchorage areas)
> > there will be 57 bottom samples on sheet Q. Likely 80 on sheet R.
> >
> > Sheet Q and R are both offshore, with very little relief (flat),
> > generally 60 to 80 meters deep, unlikely to be anchored on and are in
> > low traffic density areas. Traffic out here has typically been small
> > fishing boats and the occasional tug and barge. The mariner, using the
> > chart for safe navigation, is not gaining by numerous bottom samples on
> > these sheets.
> >
> > I am requesting a deviation from both the NHSSD and the FPM. I request
> > that we sample on these offshore sheets at 4000 m to 5000 m spacing.
> >
> > I would also like to add the recommendation that a larger separation for
> > bottom sampling be added to the FPM for offshore sheets.
> >
> > Mark



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 31, 2005

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P183-FA-2005
HYDROGRAPHIC SHEET: H11489

LOCALITY: South and East of Mountain Pt, Shumagin Islands, AK
TIME PERIOD: June 28 - August 15, 2005

TIDE STATION USED: 945-9450 Sand Point, AK
Lat. 55° 20.2'N Long. 160° 30.1' 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

Preliminary zoning is accepted as the final zoning for project OPR-P183-FA-2005, H11489, during the time period between June 28 to August 15, 2005.

Please use the zoning file "P183FA2005CORP" submitted with the project instructions for OPR-P183-FA-2005. Zones SWA204, SWA204A, SWA205 & SWA206 are the applicable zones for H11489.

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).

CHIEF, PRODUCTS AND SERVICES DIVISION



H11489 HCell Report
Katie Reser, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to directly update NOAA ENC's with new survey information in International Hydrographic Organization (IHO) format S-57. HCell compilation of survey H11489 utilized Office of Coast Survey HCell Specifications Version 3.0, May 2008 and HCell User Guide Version 1.1, June 2008. HCell H11489 will be used to update charts 16540, 1:300,000 (12th Ed.; January 2005, NM 11/29/2008), 16006, 1:1,534,076 (35th Ed.; April 2008, NM 11/29/2008) and US3AK50M.

1. Compilation Scale

The density of soundings in the HCell is compiled as appropriate to emulate those soundings of chart 16540, 1:300,000. Position and density of non-bathymetric features included in the HCell have not been generalized from the scale of the hydrographic survey H11489, 1:20,000.

2. Soundings

2.1 Source Data

A 5-meter resolution Combined BASE surface, **H11489_Combined_5m** was used as the basis for HCell production following Branch certification.

A survey-scale sounding (SOUNDG) feature object source layer was built from the **H11489_Combined_5m** surface in CARIS BASE Editor. A shoal-biased selection was made at 1:30,000 survey scale using a radius table with values shown in **Table 1**.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	100	5

Table 1

2.2 Sounding Feature Objects

In CARIS BASE Editor soundings were manually selected from the high density sounding layers from H11489 and imported into a new layer created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that more closely represents the seafloor morphology and that emulates density and distribution of soundings on chart 16540 than is possible using automated methods. See section 10.1, Data Processing Notes, for details about the use of manual sounding

selection for H11489. The sounding feature object source layer was imported into the **H11489_HCell_Features.hob** file, which was used as a template to create the S-57 Composer product **H11489_CS.prd**.

3. Depth Areas

3.1 Source Data

Using the combined BASE surface **H11489_Combined_5m**, one depth area was generated. There were no depth contours on the largest scale chart in the survey area, therefore, no contours were delivered per latest guidance from the 2009 Field Procedures Workshop.

3.2 Depth Area Feature Objects

One depth range, 35 meters to 90 meters was used for all depth area objects. Upon conversion to NOAA charting units, this depth range is 19.1 fathoms to 49.2 fathoms.

4. Meta Areas

The following Meta object areas are included in HCell 11489:

M_QUAL
M_COVR

Meta area objects were constructed on the basis of perimeter lines delineating the surveyed limits and extents of data gaps inside the survey area. These perimeters were first used to create the Skin of The Earth (SOTE) layer, then were duplicated to the Meta object layers and attributed per the H-Cell Specifications, ver. 3.0 and HCell User Guide ver. 1.1.

5. Survey Features

H11489 contains no DTONs.

H11489 contains no AWOIS items.

Twenty-one bottom samples were collected with H11489 and are included in the HCell.

No additional features are included in the H11489 HCell.

Shoreline Features

There were no shoreline features for H11489.

6. Shoreline / Tide Delineation

Depth areas (DEPARE) were created for all SOTE features.

7. Attribution

All S-57 Feature Objects have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with OCS H-Cell Specifications, ver. 3.0 and HCell User Guide ver. 1.1.

8. Layout

8.1 CARIS S-57 Composer Scheme

SOUNDG	Chart scale soundings
DEPARE	Group 1 objects (Skin of the Earth)
SBDARE	Bottom samples
M_COVR	Data coverage meta object
M_QUAL	Data quality meta object
\$CSYMB	Blue notes

8.2 Blue Notes

Notes regarding data sources are in S-57 Composer as a \$CSYMB feature with the blue note located in the INFORM field and the survey registry number, chart number, chart edition and edition date located in the NINFOM field. The blue notes are included in the HCell when it is exported to .000. The blue notes are also included as a separate ASCII file **H11489_Bluenotes.txt**.

9. Spatial Framework

9.1 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.

9.2 Horizontal and Vertical Units

During creation of sounding sets in CARIS BASE Editor, and creation of the HCell in CARIS S-57 Composer, units are maintained as metric with millimeter resolution. NOAA rounding is applied at the same time that conversion to chart units is made to the metric HCell base cell file, at the end of the HCell compilation process.

A CARIS environment variable, `uslXsounding_round`, controls the depth at which rounding occurs. Setting this variable to NOAA fathoms and feet displays all soundings from 0 to equal to or greater than 11 fathoms as whole units.

In an ENC viewer fathoms and feet display in the format `X.YZZZ`, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. For fathoms and feet between 0 and 10 fathoms 4.5 feet (10.75 fms), soundings round to the deeper foot if the decimals of the foot are `X.Y75000` or greater. For fathoms and feet deeper or equal to 11 fathoms, soundings round to the deeper fathom if feet and decimals of the foot are `X.45000` (`X.Y75000`) or greater. Drying heights are in feet and are rounded using arithmetic methods. In an ENC viewer, heights greater than 6 feet will register in fathoms and feet using the above stated rules.

S-57 Composer Units

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

Chart Unit Base Cell Units

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet (or fathoms and feet above 6 feet)
Positional Units (PUNI):	Meters

10. QA/QC

10.1 Data Processing Notes

Manual chart scale sounding selections were made for this survey. Experience has shown that in areas where bathymetry is steep sided, as in the case of this extremely steep edged fjord, automated sounding selection is impractical. None of the default sounding suppression options offered in CARIS BASE Editor or S-57 Composer yields an acceptable density and distribution of depths, generally bunching soundings nearshore with too sparse coverage seaward. While the customized options are more practical for this type of terrain, an inordinate amount of time must be spent in experimentation with variations on the algebraic terms in order to devise the most suitable formula, and manual adjustments are still required to the resulting sounding set.

10.2 ENC Validation Checks

H11489 was subjected to QA and Validation checks in S-57 Composer prior to exporting to the HCell base cell (000) file. Full millimeter precision was retained in the export of the metric S-57 base cell data set. This data set was converted to a chart unit 000 file. dKart Inspector 5.1 was then used to further check the data set for conformity using the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and errors investigated and corrected where necessary.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11489 Base Cell File, Chart Units, Soundings compiled to 1:300,000
- H11489 Base Cell File, Chart Units, Soundings compiled to 1:30,000
- H11489 Descriptive Report including end notes compiled during office processing and certification
- H11489 HCell Supplemental Report
- H11489 Blue Notes ASCII file

11.2 File Naming Conventions

S-57 Composer Product prefix: H11489_CS.prd and H11489_SS.prd

MCD Chart units base cell file: US311489_CS.000

MCD Chart units base cell file, survey scale soundings: US311489_SS.000

11.3 Software

HIPS 6.1:	Management and inspection of Combined BASE surfaces
BASE Editor 2.1:	Combination of Product Surfaces and initial creation of the S-57 bathymetry-derived features
CARIS Notebook 3.0:	Management and inspection of shoreline files
S-57 Composer 2.0:	Assembly of the HCell, S-57 products export, QA
HOM 3.3:	Assembly of the HCell, S-57 products unit conversion and sounding rounding
GIS 4.4a:	Setting the sounding rounding variable
Pydro v7.3 (r2252)	Creation of Feature and DTON reports
dKart Inspector 5.1:	Validation of the base cell file

12. Contacts

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

Katie Reser, Physical Scientist, PHB, Seattle, WA; 206-526-6864;
Katie.Reser@noaa.gov.

APPROVAL SHEET
H11489

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell 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 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.