

H11521

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. H11521

### LOCALITY

State Alaska

General Locality Southwest Alaska Peninsula

Sublocality 3 NM South of Mitrofanina Island

2006

### CHIEF OF PARTY

DEAN MOYLES

### LIBRARY & ARCHIVES

DATE \_\_\_\_\_

**HYDROGRAPHIC TITLE SHEET**

H11521

INSTRUCTIONS - The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the office.

FIELD NO.

State Alaska

General Locality Southwest Alaska Peninsula

Sublocality 3 NM South of Mitrofanina Island

Scale 1:20,000

Date of Survey 06/13/06 – 06/30/06

Instructions Dated February 3, 2006

Project No. OPR-P182-KR-06

Vessel R/V QUICKSILVER (947419) & R/V OCEAN PIONEER (557401)

Chief of Party DEAN MOYLES

Surveyed by MOYLES, ORTHMANN, REYNOLDS, GILL, MOUNT, STOCK, FARLEY, ET AL

Soundings taken by echo sounder RESON 8101 (Hull Mounted) & 8111 (Hull Mounted)

Graphic record scaled by FUGRO PELAGOS, INC. PERSONNEL

Graphic record checked by FUGRO PELAGOS, INC. PERSONNEL

Evaluation by K. Brown Automated plot by HP Designjet 1050C

Verification by K. Brown, A. Raymond

Soundings in Fathoms and Feet at MLLW

REMARKS: 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.

**A - Area Surveyed**

H11521 (Sheet E) is bound by the coordinates listed below, which encompass 3NM South of Mitrofanina Island.

Hydrographic data collection began on June 13, 2006 and ended on June 30, 2006.

**Table 1 - H11521 Sheet Limits<sup>1</sup>**

<b>Sheet Limits</b> Task Order # 1 H11521 Sheet E Scale 1:20,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	55°50'30.37" N	158°41'30.62" W
2	55°50'31.65" N	158°54'55.55" W
3	55°46'25.28" N	158°54'55.55" W
4	55°46'25.25" N	158°56'09.56" W
5	55°42'18.41" N	158°56'09.97" W
6	55°42'17.09" N	158°41'34.51" W

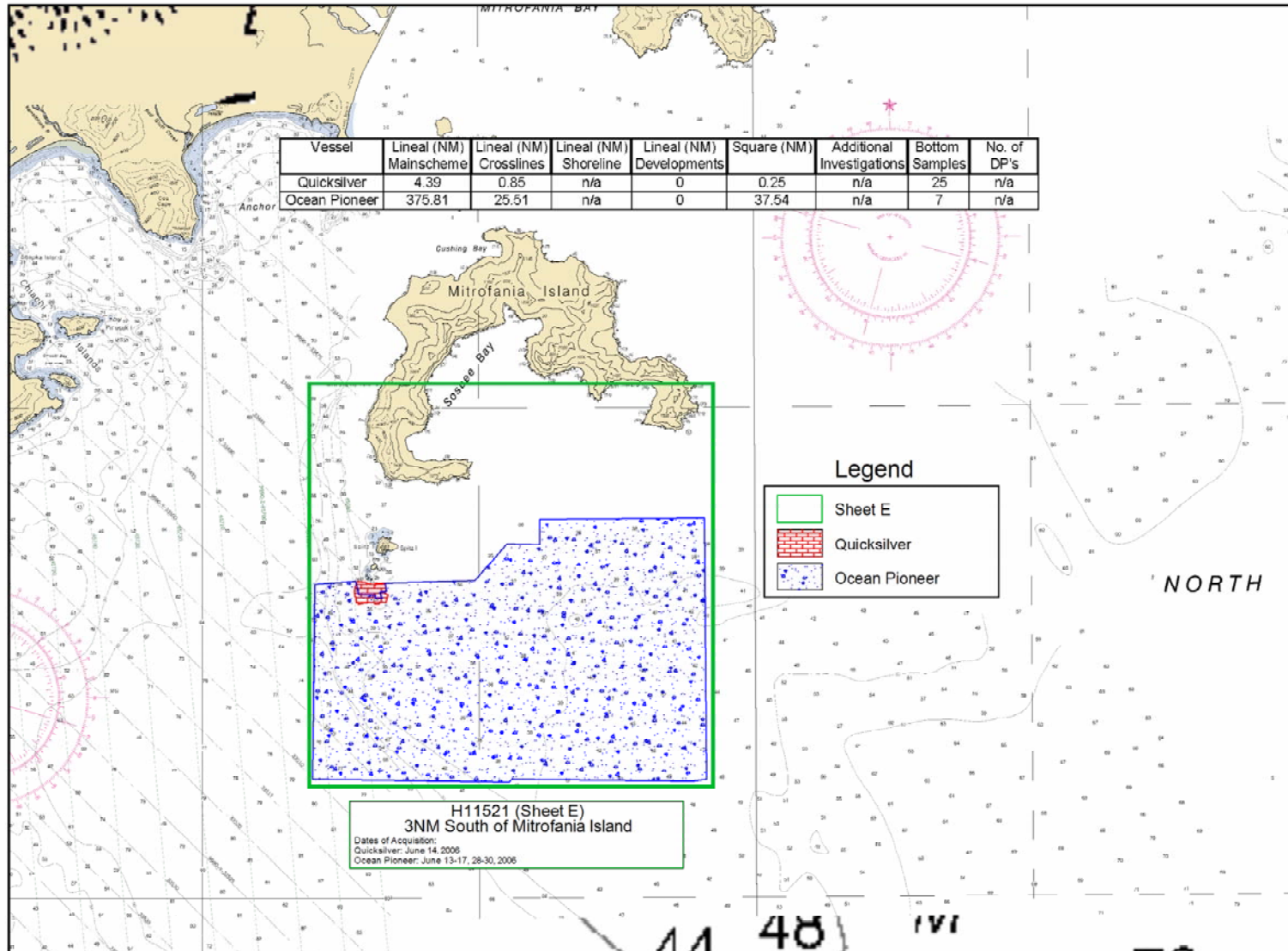


Figure 1 H11521 Area Surveyed



## **B – Data Acquisition & Processing**

Refer to the OPR-P182-KR-06 Data Acquisition and Processing Report<sup>2</sup> for a detailed description of all equipment, survey vessels, processing procedures and quality control features. Items specific to this survey and any deviations from the Data Acquisition and Processing Report are discussed in the following sections.

### Equipment & Vessels

The R/V Quicksilver acquired all near-shore sounding data for H11521. The Quicksilver, which is 32 feet in length with a draft of 3 feet, was equipped with a Reson 8101 with option 033 (pseudo Side Scan) for multibeam data acquisition. The vessel was also equipped with two AML sound velocity and pressure sensors (SV&P) for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessel (POS MV 320 V4) with XTF files logged in Triton ISIS V 7.0.413.9.

The R/V Ocean Pioneer acquired all off-shore sounding data for H11521. The Ocean Pioneer, which is 205 feet in length with a draft of 17 feet, was equipped with a Reson 8111 with option 033 (pseudo Side Scan) for multibeam data acquisition. The vessel was also equipped with two AML sound velocity and pressure sensors (SV&P) for sound velocity profiles. Vessel attitude and position were measured using an Applanix Position and Orientation System for Marine Vessel (POS MV 320 V4) with XTF files logged in Triton ISIS V 7.0.413.9.

Refer to OPR-P182-KR-06 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

### Quality Control

#### Crosslines

Quality control crosslines were planned to total at least five percent of the main scheme line length. Total crossline length surveyed was 26.4 nautical miles or 6.9 percent of the total main scheme nautical miles. Conducted crosslines were well distributed throughout the sheet to ensure adequate crossline quality control. Each crossline was compared to all main scheme lines it intersected, using the CARIS HIPS QC report routine and all were within the 95 percent confidence level.<sup>3</sup>

Note: The QC reports were generated based on the given accuracy specification of:

$$\sqrt{[a^2 + (b * d)^2]}$$

where, a = 0.5, b = 0.013 and d = depth.

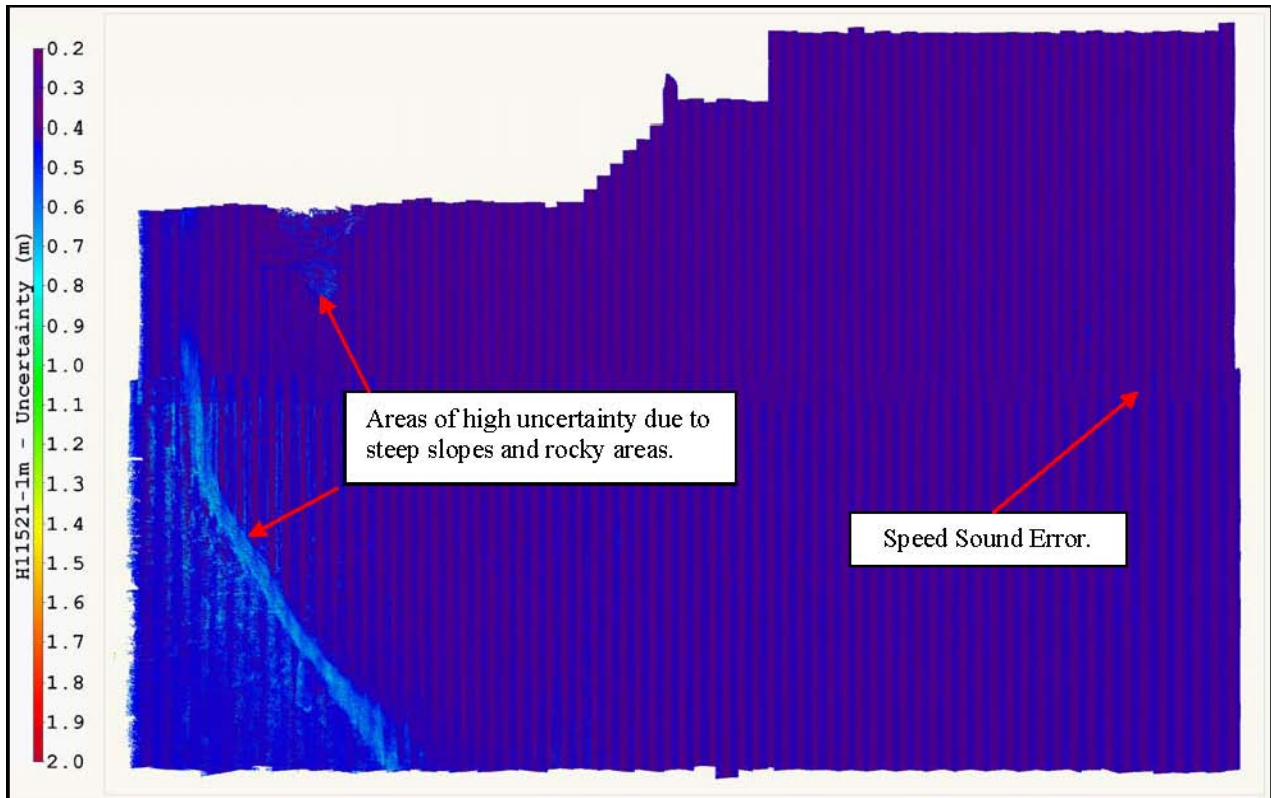
However, since a variance of a difference, rather than a variance from a mean is being used, the a and b values were defined in the user defined option within the CARIS HIPS QC Report routine:

$$a = 0.5 * \sqrt{2} = 0.707$$

$$b = 0.013 * \sqrt{2} = 0.018$$

Uncertainty Values (CARIS BASE Surface)

The majority of H11521 had uncertainty values of about 0.250 to 0.30 meters. Values of high uncertainty ranged from 0.50 to 0.7 meters, which are displayed in the graphic below. No uncertainty values were greater than the IHO level Order 1.<sup>4</sup>

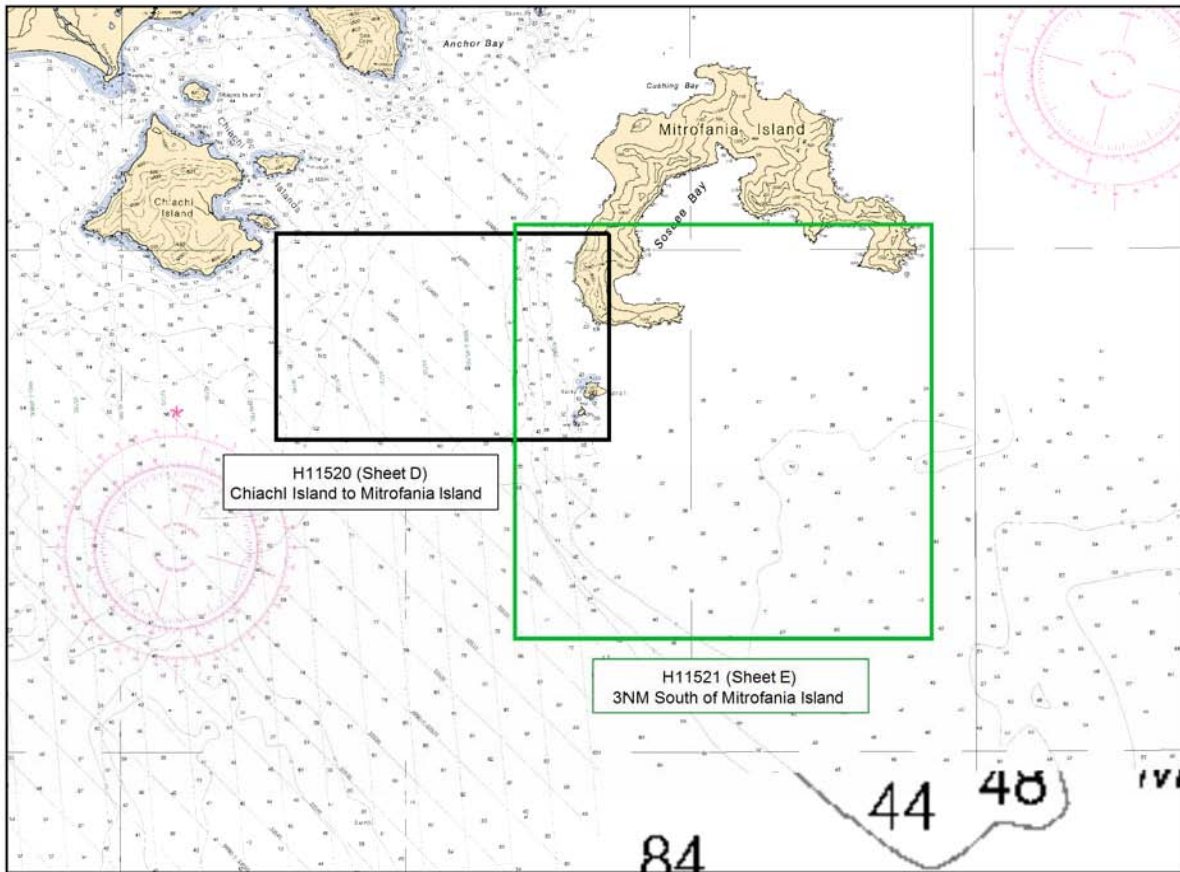


**Figure 2 Uncertainty DTM**

Survey Junctions<sup>5</sup>

H11521 (Sheet E) junctions with:

Registry #	Scale	Date	Junction Side
H11520	1:10,000	2006	West



**Figure 3 H11521 Survey Junctions**

The surveys are in agreement along their common borders. The agreement was noted in the field using the CUBE surfaces during subset cleaning. The conformity is also apparent in the Final Combined BASE Surfaces.<sup>6</sup>



### Quality Control Checks

During the hydrographic survey OPR-P182-KR-06 the R/Vs Quicksilver and Ocean Pioneer conducted a number of confidence checks. This usually consisted of the vessels running two lines in the opposite direction over a reference surface (normally the patch test site). The data sets collected with Reson 8101 and 8111 systems that were installed on the Quicksilver and Ocean Pioneer respectively, compared within 5 to 10 centimeters.

Positioning system confidence checks were conducted on a daily basis using the POS MV controller software. The controller software had numerous real time displays that were monitored throughout the survey to ensure the positional accuracies specified in the NOS Hydrographic Surveys Specifications and Deliverables (version June 2006) were achieved. These include, but are not limited to the following: GPS Status, Position Accuracy, Receiver Status (which included HDOP) and Satellite Status. During periods of high HDOP and/or low number of available satellites survey operations were stopped.

### Data Quality

In general, the multibeam data quality for H11521 was excellent. One notable problem follows:

- During data acquisition and routine processing, a general downward and/or upward cupping was noticed in the across track sounding profiles for certain areas. This is possibly due to a high volume of thermal layering and strong under currents in the water column. This problem was addressed by conducting SVP casts more frequently and reducing the line spacing interval. Even though this SVP error is noticeable on the Uncertainty surface, the data are well within the required specifications.<sup>7</sup>

Refer to the OPR-P182-KR-06 Data Acquisition and Processing Report for a detailed description of the survey equipment and methodology used over the course of this survey.

### Corrections to Echo Soundings

Refer to the OPR-P182-KR-06 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings and lead line measurements. No deviations from the report occurred.<sup>8</sup>





## Data Processing

Refer to the OPR-P182-KR-06 Data Acquisition and Processing Report for a detailed description of the processing flow.

The final BASE surface for H11521 is called H11521-Final and it contains three different BASE surfaces of different resolutions.<sup>9</sup> To ensure sufficient overlap between these surfaces the follow parameters were used:

- Depth Threshold: 15 to 40 meters resolution=1m, Name in BASE Surface H11521-1m
- Depth Threshold: 30 to 65 meters resolution=2m, Name in BASE Surface H11521-2m
- Depth Threshold: 60 to Max depth resolution=5m, Name in BASE Surface H11521-5m

The final S57 file for this project is called "H11521\_S57\_Features.000". This file contains all bottom sample feature data for this project in S57 format as required in the Specifications and Deliverables.<sup>10</sup>



### C –Vertical & Horizontal Control

Refer to the OPR-P182-KR-06 Horizontal and Vertical Control Report for a detailed description of the horizontal and vertical control used on this survey. No deviations from the report occurred.<sup>11</sup> A summary of the project’s horizontal and vertical control follows.

#### Horizontal Control

The horizontal control datum for this survey was the North American Datum of 1983 (NAD83). All raw positions were originally collected in WGS84 and transformed to NAD83 during the post-processed kinematic GPS (KGPS) routine.

It was necessary to acquire dual frequency GPS data at a known location/s on the ground so that a KGPS solution could be used for final positioning. JOA established two local control points: station “SITE 1” was located on the USCGS station MIT (UW0401) and station “SITE 2”, was located on a piece of pipe off of “SITE 1”. Refer to the Appendix B of the Vertical & Horizontal Control Report for results and procedures.

Vessel position was determined in real time using a Trimble Zephyr L1/L2 GPS antenna, which was connected to a Trimble BD950 L1/L2 GPS card residing in the POS MV. The POS MV was setup via the Com 2 to accept USCG differential corrections, which were output from a CSI MBX-3S Coast Guard beacon receiver. Note: since the pseudorange corrections received by the POS MV are based on the NAD 83 position of the reference station antenna position, all final positions and are in all practical sense NAD 83. However, final positions were determined using a post-processed KGPS solution using the POSpac 4.3 processing software (Refer to the “2006-NOAAProcessingProcedures” document for KGPS processing procedure).

**Table 2 - DGPS Stations**

Station	ID	Latitude	Longitude	Freq.	Tx. Rate	Rx. No.	Wt.
Cold Bay, USCG	296	55°05’30”N	162°31’54” W	289	100BPS	1	1
Kodiak, USCG	295	57°37’06”N	152°11’36”W	313	100BPS	2	1

Positioning system confidence checks were conducted on a daily basis using the POS MV controller software. The controller software has numerous real time displays that were monitored throughout the survey to ensure the positional accuracies specified in the NOS Hydrographic Surveys Specifications and Deliverables (version June 2006) were achieved. These include, but are not limited to the following: GPS Status, Position accuracy, Receiver Status (which included HDOP) and Satellite Status. During periods of high HDOP and/or low number of available satellites survey operations were suspended.



Vertical Control

All sounding data were initially reduced to mean lower low water (MLLW) using unverified tidal data from one tide station located on Mitrofanía Island, AK. A sub-contractor, John Oswald & Associates LLC (JOA), operated the gauge.

**Table 3 - Tide Gauges**

Gauge	Model	Gauge Type	Location	Latitude	Longitude	Operational
9459016	H350/355	Digital Bubbler	Mitrofanía Island, AK	55°53'22"N	158°49'11" W	May-July

**Table 4 - Final Tide Zones**

Zone	Primary			
	Site	Number	Time	Range Ratio
JOA001	Mitrofanía Island, AK	9459016	0	1.00
JOA002	Mitrofanía Island, AK	9459016	-6	1.00
JOA003	Mitrofanía Island, AK	9459016	-6	1.07
JOA004	Mitrofanía Island, AK	9459016	-12	1.00
JOA005	Mitrofanía Island, AK	9459016	-12	1.07
JOA006	Mitrofanía Island, AK	9459016	-12	1.14

Tidal data for a twenty-four hour period, UTC (Alaska Daylight Time to UTC was +8 hours), was assembled by JOA and e-mailed to the Ocean Pioneer at the end of every Julian Day. A cumulative file for the gauge was updated each day by appending the new data.

On September 9, 2006, JOA issued verified tidal data and final zoning for OPR-P182-KR-06. The tidal zoning was modified by JOA, providing a simpler zoning scheme from those issued in the Statement of Work (for additional information, refer to JOA's Final Technical Report).<sup>12</sup> From September 20, 2006 to September 22, 2006 all sounding data were re-merged using CARIS HIPS and SIPS tide routine. Verified tidal data were used for the final Navigation Base Surfaces and S57 Feature files. Refer to the Vertical and Horizontal Control Report for additional tidal information and station descriptions.

## D – Results and Recommendations

### Chart Comparison

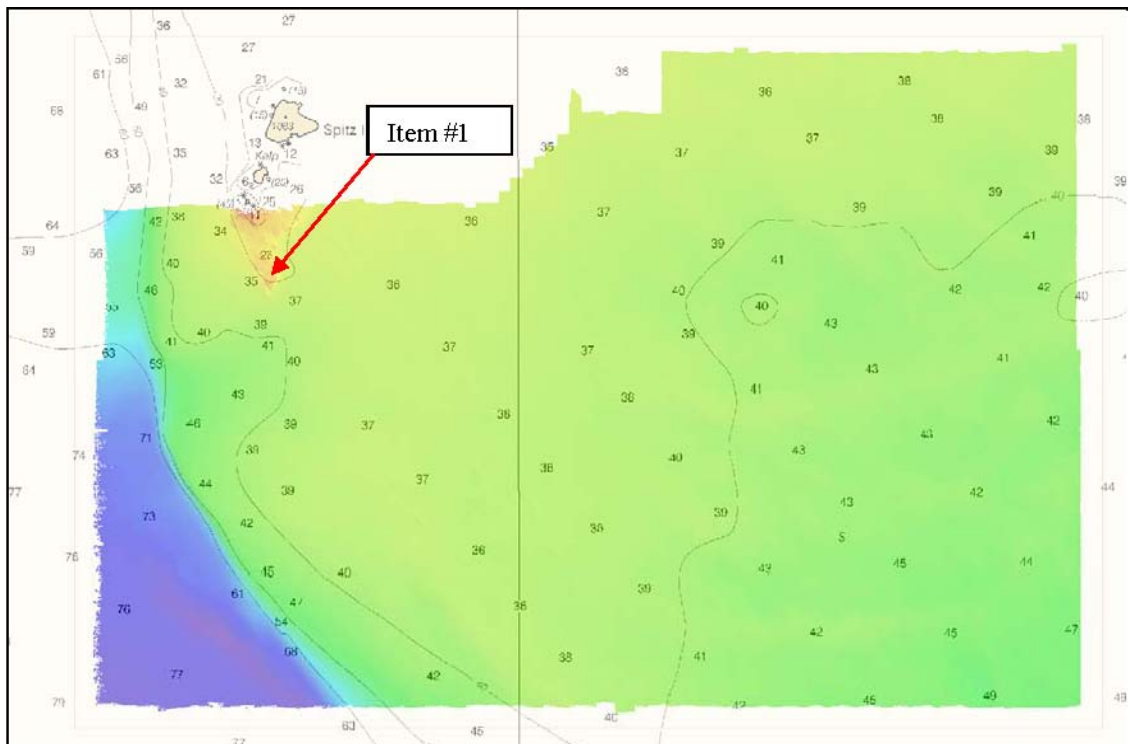
H11521 survey was compared with charts:

Chart Number	Scale	Edition	Edition Date as of Feb. 2006
	OPR-P182-KR-06		
16006	1:1,534,076	33 <sup>rd</sup>	Dec. 2000
16011	1:1,023,188	36 <sup>th</sup>	Aug. 2004
16013	1:969,761	29 <sup>th</sup>	Nov. 2003
16556	1:80,000	4 <sup>th</sup>	Nov. 2002
16561	1:80,000	2 <sup>nd</sup>	Mar. 2005

### Comparison of Soundings

The soundings from chart 16561 coincide with the soundings from H11521 to within 1 to 3 fathoms<sup>13</sup>; areas that do vary to any degree are as follows:

1. Hydrographic survey H11521 revealed a depth of 24 fathoms, located at 55°45'53.14" N, 158°53'36.91" W, which is in the vicinity of a 35 fathom sounding on chart 16561.<sup>14</sup> This area was surveyed with 100% multibeam coverage.



**Figure 4 H11521 Chart Comparison**



Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11521.<sup>15</sup>

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11521.<sup>16</sup>

Dangers to Navigation

No dangers to navigation were located during the hydrographic survey of H11521.<sup>17</sup>

Additional Results

Additional Item Investigations

None were assigned for this sheet.<sup>18</sup>

Bottom Samples

On June 15 & 16, 2006 the R/V Quicksilver and on July 27, 2006 the R/V Ocean Pioneer were fitted to obtain bottom samples as specified in the Statement of Work. The purpose of this was to characterize the bottom in charted anchorages and for general bottom classification.

Samples were taken with a Van Veen grab sampler and position was recorded with WinFrog V3.6. Sediment retrieved from the sampler were analyzed and then encoded with the appropriate S-57 attributes. Positions and descriptions of all samples are found in Appendix V<sup>19</sup> and in the H11521 S-57 feature file<sup>20</sup>.

Aids to Navigation

There were no charted aids to navigation in the survey area. No uncharted aids to navigation were found in the survey area.<sup>21</sup>



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**E – Approval Sheet**

**Approval Sheet**

For

**H11521**

Standard field surveying and processing procedures were followed in producing this survey in accordance with the following documents:

OPR-P182-KR-06 statement of work and hydrographic manual;  
Fugro Pelagos, Inc. Acquisition Procedures (2006- NOAAAcquisitionProcedures);  
Fugro Pelagos, Inc. Processing Procedures (2006-NOAAProcessingProcedures);  
Technical Report for Tides, 9459016 Mitrofanina Report Complete 2006

The data were reviewed daily during acquisition and processing.

This report has been reviewed and approved. All records are forwarded for final review and processing to the Chief, Pacific Hydrographic Branch.

Approved and forwarded,

A handwritten signature in cursive script, reading "Dean Moyles", with a vertical red line to its right.

Dean Moyles,  
Lead Hydrographer  
Fugro Pelagos, Inc. Survey Party



<sup>1</sup> Do not concur with sheet limits. Sheet limits roughly are counter clockwise from the NE corner:

<b>Sheet Limits</b> Task Order # 1 H11521 Sheet E Scale 1:20,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	55°47'51.55" N	158°41'34.51" W
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3	55°46'25.28" N	158°50'52.48" W
4	55°46'25.25" N	158°56'09.56" W
5	55°42'18.41" N	158°56'09.97" W
6	55°42'17.09" N	158°41'34.51" W

<sup>2</sup> Filed with project records.

<sup>3</sup> Concur.

<sup>4</sup> Concur.

<sup>5</sup> Concur with clarification. H11521 also junctions with survey H11477 and H11478 from OPR-P182-RA-05. Cursory inspection during compilation shows good agreement in the junctioning areas.

<sup>6</sup> Concur.

<sup>7</sup> Concur. All data are adequate to supersede charted data in the common area.

<sup>8</sup> Concur.

<sup>9</sup> Final surfaces were combined for compilation at 5m.

<sup>10</sup> Concur. All bottom samples are includes in HCell for H11521.

<sup>11</sup> Filed with project records.

<sup>12</sup> Do not concur. According SAR preliminary zoning was accepted as final zoning. Verified water levels with the final zoning have been applied to all data.

<sup>13</sup> Concur.

<sup>14</sup> Concur with clarification. A 23 fathom sounding is included in the HCell at this position.

<sup>15</sup> Concur.

<sup>16</sup> Concur

<sup>17</sup> Concur.

<sup>18</sup> Concur.

<sup>19</sup> Filed with hydrographic records.

<sup>20</sup> All bottom samples included in HCell for H11521 and should fully supersede charted bottom samples in the common area.

<sup>21</sup> Concur.

**H11521 HCell Report**  
Annie Raymond, 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 H11521 utilized Office of Coast Survey HCell Specifications Version 3.0, May 2008 and HCell User Guide Version 1.1, June 2008. HCell H11521 will be used to update charts 16561, 1:80,000 (3<sup>rd</sup> Ed.; March 2007, NM 2/7/2009), 16556, 1:80,000 (5<sup>th</sup> Ed.; April 2006, NM 2/14/2009), 16013, 1:969,761 (30<sup>th</sup> Ed.; July 2006, NM 2/7/2009), 16011, 1:1,023,188 (37<sup>th</sup> Ed.; November 2007, NM 2/7/2009), 16006, 1:1,534,076 (35<sup>th</sup> Ed.; April 2008, NM 2/7/2009) and US4AK59M.

**1. Compilation Scale**

The density of soundings in the HCell is compiled as appropriate to emulate those soundings of chart 16561, 1:80,000. Position and density of non-bathymetric features included in the HCell have not been generalized from the scales of the hydrographic surveys H11521, 1:20,000.

**2. Soundings**

**2.1 Source Data**

A 5-meter resolution Combined BASE surface, **H11521\_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 **H11521\_Combined\_5m** surface in CARIS BASE Editor. A shoal-biased selection was made at 1:20,000 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	175	5

**Table 1**

**2.2 Sounding Feature Objects**

In CARIS BASE Editor soundings were manually selected from the high density sounding layers from H11521 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 16561 than is possible using automated methods. See



section 10.1, Data Processing Notes, for details about the use of manual sounding selection for H11521. The sounding feature object source layer was imported into the **H11521\_HCell\_Features.hob** file, which was used as a template to create the S-57 Composer product **H11521\_CS.prd**.

### **3. Depth Areas**

#### **3.1 Source Data**

Using the combined BASE surface **H11521\_Combined\_5m** one depth area was generated. Additional depth contours at the intervals on the largest scale chart were delivered per latest guidance from the 2009 Field Procedures Workshop. The depth contours are included in the **US411521\_SS.000** file.

#### **3.2 Depth Area Feature Objects**

One depth range, 10 meters to 160 meters, was used for all depth area objects. Upon conversion to NOAA charting units, this depth range is 5.5 fathoms to 87 fathoms.

### **4. Meta Areas**

The following Meta object areas are included in HCell 11521:

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 HCell Specifications, ver. 3.0 and HCell User Guide ver. 1.1.

### **5. Survey Features**

No DTONs were reported from H11521.

H11521 contains no AWOIS items.

Thirty-one bottom samples were collected with H11521 and are included in the HCell. No charted bottom samples were retained.

One rocky seabed area was delineated using the 5 meter resolution BASE surface and is included in the HCell as delivered.

## **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 HCell 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 and rocky seabed areas
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 and 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 **H11521\_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**

H11521 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

- H11521 Base Cell File, Chart Units, Soundings compiled to 1:80,000
- H11521 Base Cell File, Chart Units, Soundings compiled to 1:20,000
- H11521 Descriptive Report including end notes compiled during office processing and certification
- H11521 HCell Supplemental Report
- H11521 Blue Notes ASCII file

### 11.2 File Naming Conventions

S-57 Composer Product prefix: *H11521\_CS.prd and H11521\_SS.prd*

MCD Chart units base cell file: *US411521\_CS.000*

MCD Chart units base cell file, survey scale soundings: *US411521\_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:

Annie Raymond, Physical Scientist, PHB, Seattle, WA; 206-526-6849;  
Annie.Raymond@noaa.gov.

APPROVAL SHEET  
H11521

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.