

H11517

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. H11517

LOCALITY

State Alaska

General Locality Southwestern Alaskan Peninsula

Sublocality Chiachi Island

2006

CHIEF OF PARTY

..... Dean Moyles, Fugro Pelagos, Inc.

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11517

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 Southwestern Alaskan Peninsula

Sublocality Chiachi Island

Scale 1:10,000

Date of Survey June 8, 2006 - June 15, 2006

Instructions Dated 2/3/2006

Project No. OPR-P182-KR-06

Vessel R/V QUICKSILVER (947419)

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)

Graphic record scaled by FUGRO PELAGOS, INC. PERSONNEL

Graphic record checked by FUGRO PELAGOS, INC. PERSONNEL

Evaluation by B. Johnston

Automated plot by N/A

Verification by B. Johnston, K. Reser

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

H11517 (Sheet A) is bound by the coordinates listed below, which encompasses Chiachi Island.

Hydrographic data collection began on June 8, 2006 and ended on June 15, 2006.

Table 1 – H11517 Sheet Limits

Sheet Limits Task Order #1 H11517 Sheet A Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	55°55'13.58" N	159°06'07.54" W
2	55°55'13.58" N	159°10'49.58" W
3	55°51'40.59" N	159°10'49.58" W
4	55°51'40.59" N	159°06'07.54" W

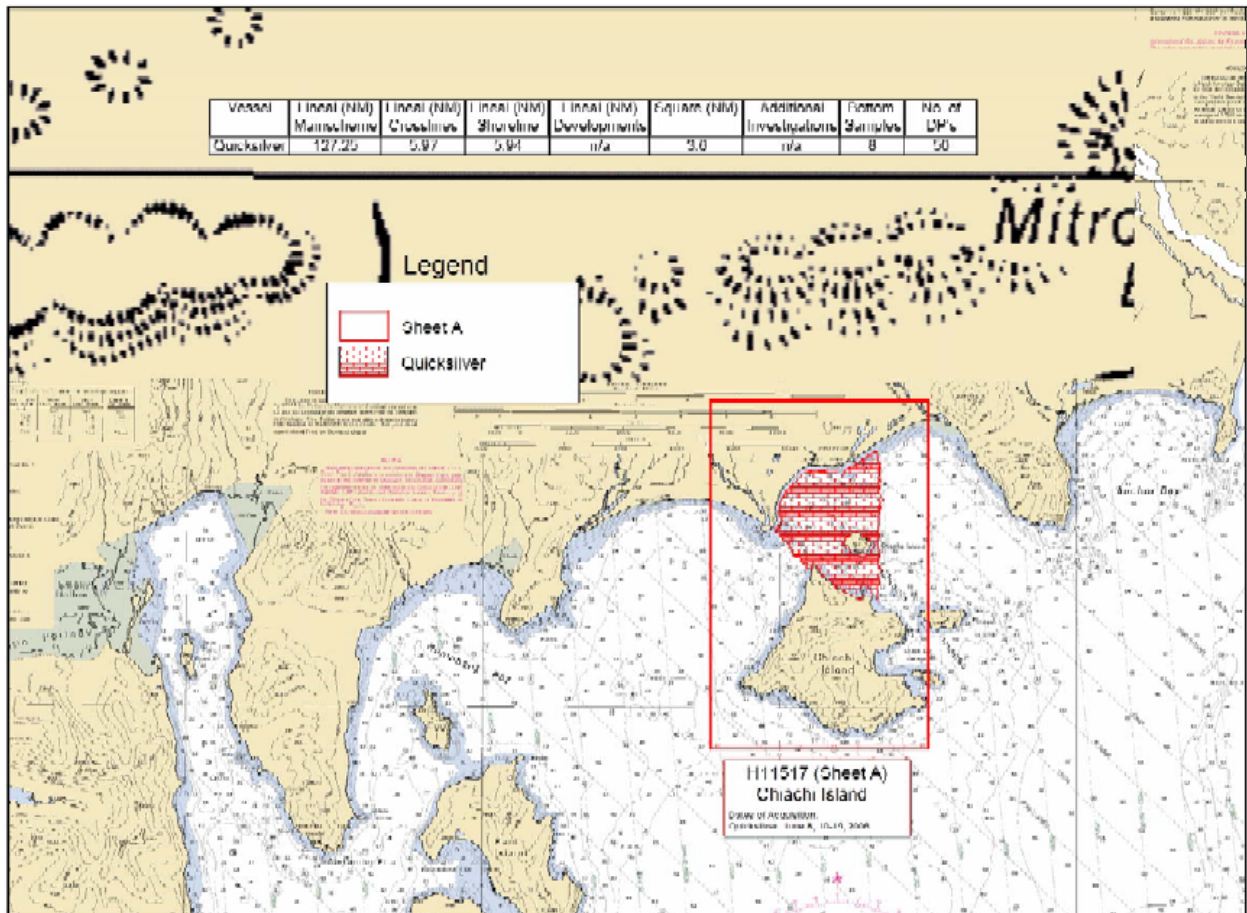


Figure 1: H11517 Area Surveyed



B – Data Acquisition and Processing

Refer to the OPR-P182-KR-06 Data Acquisition and Processing Report¹ 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 sounding data for H11517. The Quicksilver, which is 32 feet in length with a draft of 3 feet, was equipped with a Reson 8108 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.

A 25 ft skiff, referred to as the DP Skiff, was used to perform item investigations and shoreline verification. The skiff was equipped with a CSI GBX-PRO DGPS receiver, WinFrog v3.6.0 data acquisition system (operated on a Dell laptop), laser range finder and a Sony digital camera. NOAA nautical charts & LIDAR Smooth Sheets² were displayed as a layer in WinFrog for reference. All soundings on submerged features were collected by the Quicksilver. The DP Skiff was utilized to mark locations of exposed rocks. A West Marine Single Beam Echosounder was used to aid the hydrographer on the skiff in locating the shoalest point of targets near the surf zone or areas of limited visibility.

Heights were taken on features awash or above the water level by visual estimation, using simultaneous comparison to a known reference (the vessel's bow).

Refer to OPR-P182-KR-06 Data Acquisition and 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 5.97 nautical miles or 4.7 percent of the total main scheme nautical miles.³ 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.

The majority of QC Reports fall well within the required accuracy specifications.³ However, beams that fall below the 95 percent confidence level in the QC Report are associated with specific areas and conditions illustrated below. It should be noted that data at these locations are in agreement with the surrounding offset lines and are considered well within the required specifications.⁴

The majority of beams that fell outside of the 95 percent confidence level were located in areas having extreme steep slopes and/or rocks. The figure below shows an example of this.

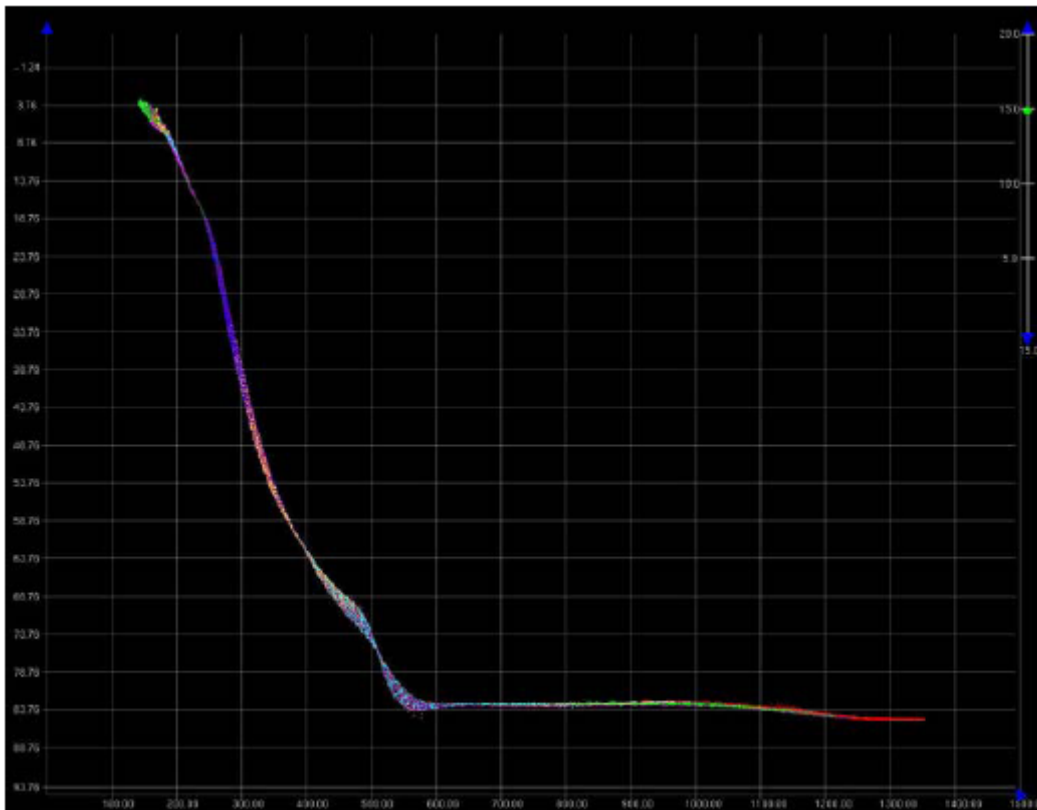


Figure 2: Profile of 1A02-TIE01

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

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

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 H11517 had uncertainty values of about 0.250 meters, but for areas having extremely steep slopes or deemed to be rocky, values ranged from 0.40 to 0.65 meters. No uncertainty values were greater than the IHO level Order 1.⁵

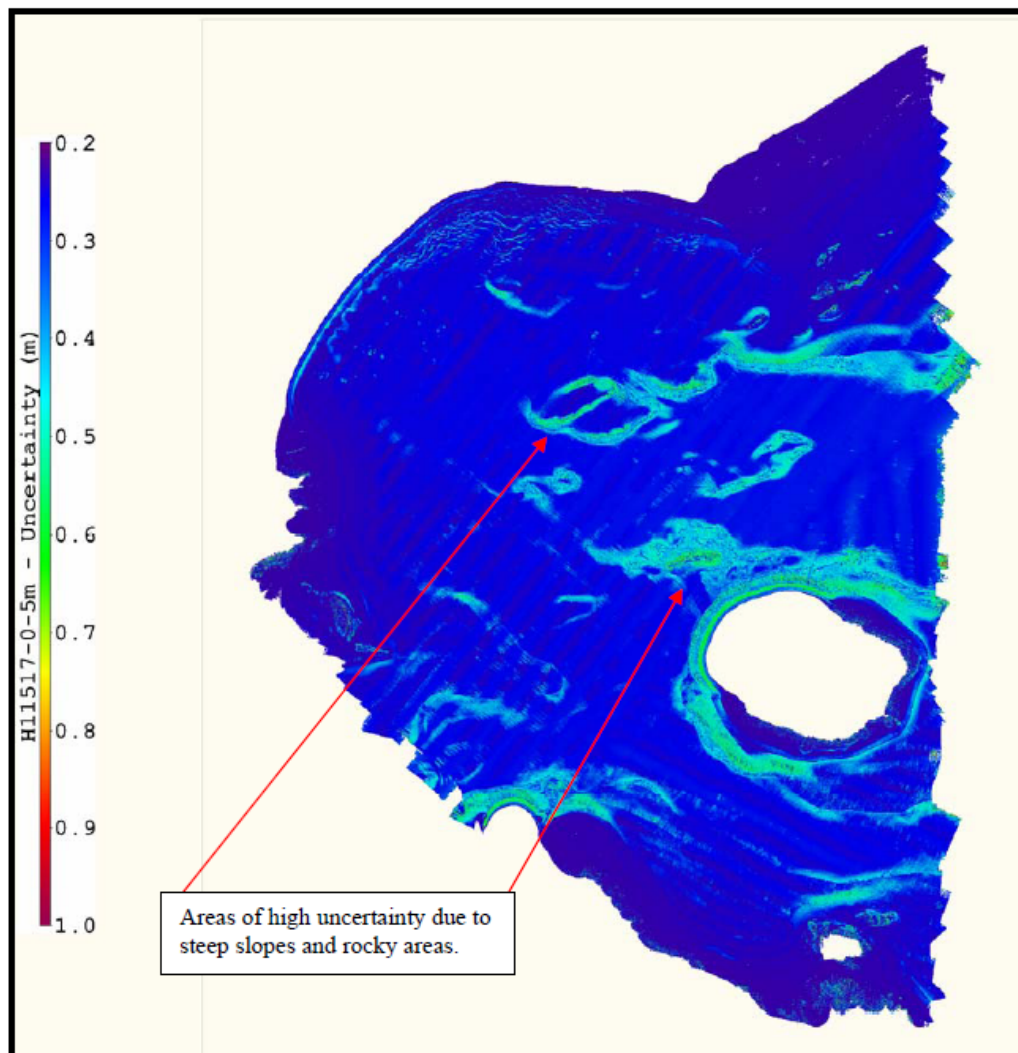


Figure 3: Uncertainty DTM

Survey Junctions

H11517 (Sheet A) junctions with⁶:

Registry #	Scale	Date	Junction Side
H11518	1:10,000	2006	East

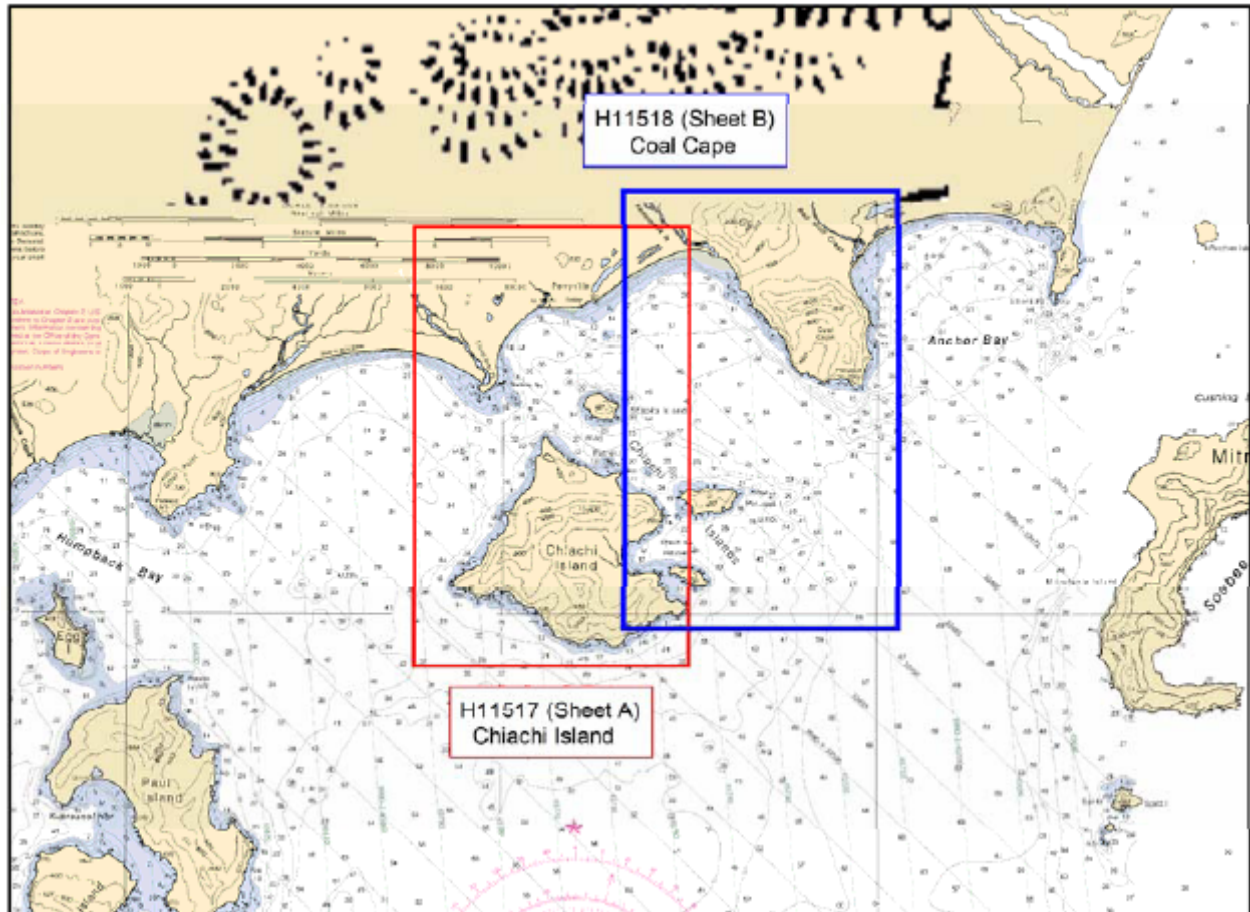


Figure 4: H11517 Survey Junctions

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.⁷



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. Note that the Quicksilver was the only vessel which surveyed in this sheet – the Ocean Pioneer surveyed in adjacent sheets and the data was used as a comparison.

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 H11517 was excellent and no unusual conditions were encountered.⁸ 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.

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.⁹

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 H11517 is called H11517-Final and it contains four different BASE surfaces of different resolutions.¹⁰ To ensure sufficient overlap between these surfaces the following parameters were used:



- Depth Threshold: 0 to 20 meters resolution=0.5m, Name in BASE Surface H11517-0-5m
- Depth Threshold: 15 to 33 meters resolution=1m, Name in BASE Surface H11517-1m
- Depth Threshold: 30 to 65 meters resolution=2m, Name in BASE Surface H11517-2m
- Depth Threshold: 60 to Max depth resolution=5m, Name in BASE Surface H11517-5m

The final S57 file for this project is called “H11517_S57_Features.000”. This file contains all shoreline and bottom sample feature data for this project in S57 format as required in the Specifications and Deliverables.¹¹

C –Vertical & Horizontal Control

Refer to the OPR-P182-KR-06 Horizontal and Vertical Control Report¹² for a detailed description of the horizontal and vertical control used on this survey. A summary of the project’s horizontal and vertical control follows. No deviations from the report occurred.

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 II 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 positions were 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 Mitrofanian 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	Mitrofanian 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	Mitrofanian Island, AK	9459016	0	1.00
JOA002	Mitrofanian Island, AK	9459016	-6	1.00
JOA003	Mitrofanian Island, AK	9459016	-6	1.07
JOA004	Mitrofanian Island, AK	9459016	-12	1.00
JOA005	Mitrofanian Island, AK	9459016	-12	1.07
JOA006	Mitrofanian 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). 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.¹³ Refer to the Vertical and Horizontal Control Report for additional tidal information and station descriptions.

D – Results and Recommendations

Chart Comparison

H11517 survey was compared with charts¹⁴:

Chart Number	Scale	Edition	Edition Date as of Feb. 2006
OPR-P182-KR-06			
16006	1:1,534,076	33 rd	Dec. 2000
16011	1:1,023,188	36 th	Aug. 2004
16013	1:969,761	29 th	Nov. 2003
16556	80,000	4 th	Nov. 2002
16561 ¹⁵	80,000	2 nd	Mar. 2005

Comparison of Soundings

The soundings from chart 16556 coincide with the soundings from H11517 to within 1 to 3 fathoms; areas that do vary to any degree are as follows:

1. Hydrographic survey H11517 revealed a depth of 23 fathoms in the vicinity of a 38 fathom sounding on chart 16556 located at 55°53'54.57" N, 159°07'42.64" W.¹⁶ This area was surveyed with 100% multibeam coverage. The shoaling is centered in the area depicted below.

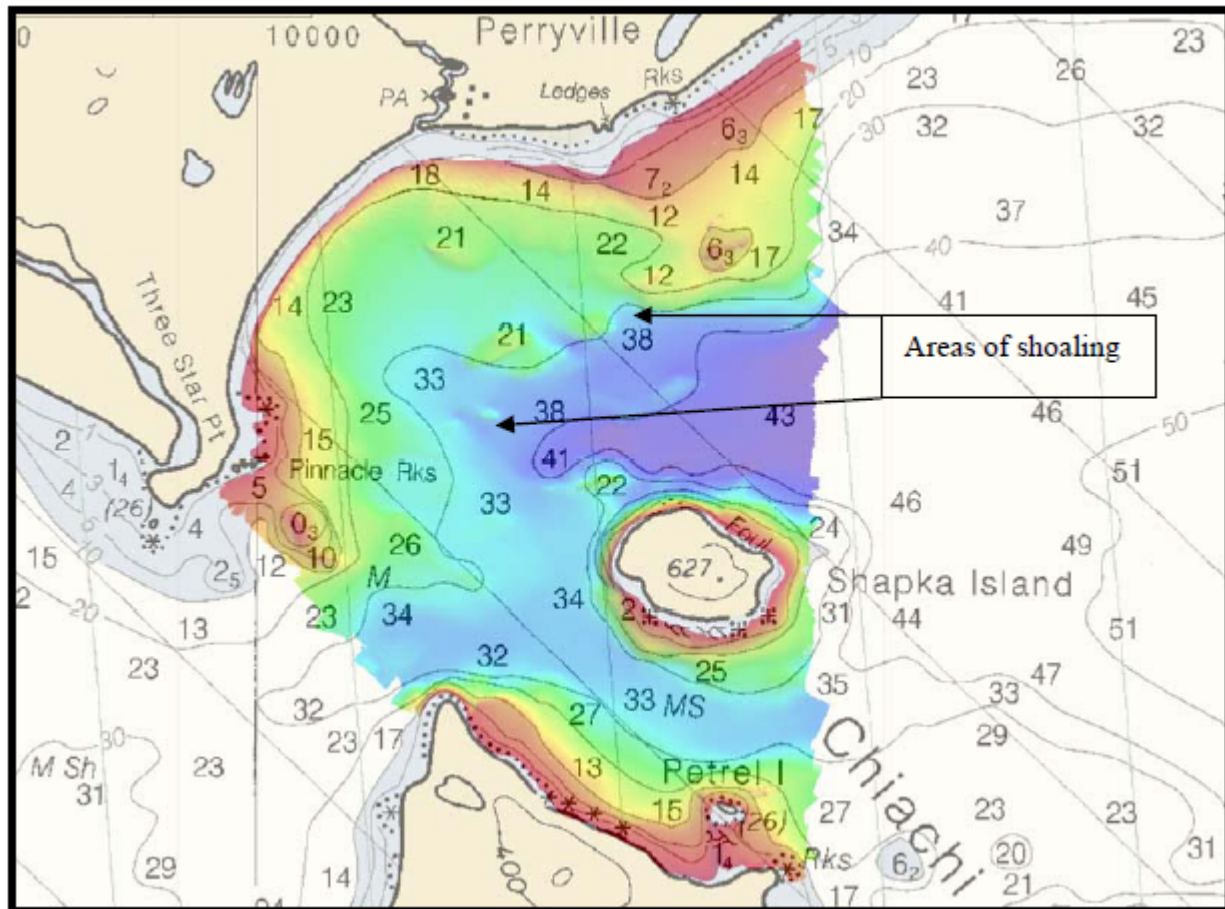


Figure 5: H11517 Chart Comparison

Automated Wreck and Observation Information System

There were no AWOIS items assigned to H11517.¹⁷

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11517.¹⁸

Dangers to Navigation

Two dangers to navigation were located during the hydrographic survey of H11517 and were reported on June 29, 2006.¹⁹



Additional Results

Additional Item Investigations

None were assigned for this sheet.²⁰

RSD Shoreline Verification Results

Remote Sensing Division (RSD) provided the shoreline detail (GC10571) for this sheet. Since the RSD shoreline was the official shoreline source provided by NOAA, primary focus was given to its verification during this survey. However, significant previously charted features were also investigated as were any significant new features found during the course of shoreline verification. Significant features were deemed to be those dangerous to navigation and / or seaward of the 4m contour.

Visual inspection during shoreline verification deemed the RSD shoreline very accurate in general. The mean high water (MHW) line and point features (rocks, islets) provided in the RSD source were particularly good. No significant MHW or point feature discrepancies were found during field investigation, and the Hydrographer recommends that it supersede previously charted shoreline where any discrepancies occur.²¹

Since no variations were found, the MHW line from the RSD data is replicated in the S57 Feature file without modification. Likewise, rocks and islets originating from the RSD data appear in their RSD position.²²

Foul areas as delineated in the RSD data were also found to be accurate, except in two cases noted below:

- RSD Foul Area at 55° 52' 56.13" N, 159° 07' 22.36" W did not extend seaward enough to adequately depict the foul area off the south side of the island—heavy kelp and rocks were found outside the foul area. The foul area has been extended in the S57 feature file to include these areas. Recommend charting as depicted in the S57 feature file.²³
- RSD Foul Area at 55° 52' 24.00" N, 159° 08' 20.73" W did not extend northwest along the coast enough to adequately depict the foul area. The foul area has been extended in the S57 Feature file to include this area. Recommend charting as depicted in the S57 feature file.²⁴ See DP form JD154_07.²⁵



Changes to Charted Features and Removals

Charted rock (chart 16556) at 55° 52' 21.64" N, 159° 08' 14.65" W was not found during this survey. A visual search in clear water at low tide did not reveal a rock at this position.

Recommend removal of rock symbol.²⁶ See DP form JD154_11.²⁷

Charted rock (chart 16556) at 55° 52' 20.17" N, 159° 08' 07.42" W was not found during this survey. A visual search in clear water at low tide did not reveal a rock at or near this position.

Recommend removal of rock symbol.²⁸ See DP form JD154_12.²⁹

Charted rock (chart 16556) at 55° 52' 18.27" N, 159° 07' 58.47" W was not found during this survey. A visual search in clear water at low tide did not reveal a rock at or near this position.

Recommend removal of rock symbol.³⁰ See DP form JD154_13.³¹

Charted rock (chart 16556) at 55° 52' 15.28" N, 159° 07' 48.45" W was not found during this survey. A visual search in clear water at low tide did not reveal a rock at or near this position.

Recommend removal of rock symbol.³² See DP form JD154_14.³³

Charted rock (chart 16556) at 55° 52' 06.98" N, 159° 06' 49.85" W was not found at this position. However, a rock was found nearby in the RSD data. Recommend removal of rock symbol at charted position, and charting of rock at RSD position as depicted in the S57 feature file.³⁴ See DP form JD154_17.³⁵

Charted rock (chart 16556) at 55° 53' 40.29" N, 159° 09' 56.16" W was not found as a distinct rock. However, a visible shoaling was noted. Least depth was not obtained; recommend charting of rock as depicted in the S57 feature file, depth unknown.³⁶ See DP form JD153_102.³⁷

Charted ledges (chart 16556) at 55° 54' 37.20" N, 159° 07' 54.82" W were not observed during this survey.³⁸ Large pillar rocks above MHW were noted.

Bottom Samples

On June 14, 2006 the R/V Quicksilver was 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.³⁹ Positions and descriptions of all samples are found in Appendix V and in the H11517_S57_Features file.



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.⁴¹

Shoreline Correlator Sheet

ArcMap v9.0 with the Shoreline Correlator add-on, written by the Fugro Pelagos Inc. GIS department, aided in the processing of the investigation results. The Correlator utilized the Winfrog Log files to create an individual DP form for all acquired DP's. The Correlator was mapped to the Log, Tide, Photos, NOAA Chart (largest scale available), LIDAR Data, Smooth Sheet Soundings and Multibeam Coverage to calculate and display the desired information for each DP. The DP forms and raw field records can be found on the Project DVD under Reports\Descriptive Reports\H11517 Shoreline.



E – Approval Sheet

Approval Sheet

For

H11517

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", written in black ink on a white background.

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



Revisions Compiled During Office Processing and Certification

- ¹ Filed with project records.
- ² There was no LIDAR junction with this survey.
- ³ Concur.
- ⁴ Concur.
- ⁵ Concur.
- ⁶ Concur.
- ⁷ Concur.
- ⁸ Concur. These data are adequate to supersede charted data in the common area.
- ⁹ Concur.
- ¹⁰ Concur with clarification. The BASE surface used for compilation was a 5m combined surface named H11517_Combined_5m.
- ¹¹ All surveyed features included in HCell H11517 have been de-conflicted and reduced to chart scale. All bottom samples collected during survey H11517 are included in HCell H11517.
- ¹² Filed with project records.
- ¹³ Concur. Final approved water levels have been applied to all data.
- ¹⁴ Concur with clarification. Survey H11517 also falls on chart 16540, scale 1:300,000. A cursory comparison during compilation shows agreement within 1 to 3 fathoms.
- ¹⁵ No part of survey H11517 falls on chart 16561.
- ¹⁶ Concur. The 23 fathom sounding is included in HCell H11517.
- ¹⁷ Concur.
- ¹⁸ Concur.
- ¹⁹ Concur. The first DTON was a reported 5fm 4ft rock located at 55-54-08.59N, 159-07-13.05W. The rock was applied to the charts, and it is included as a submerged rock in HCell H11517. The second DTON was a reported 8fm 5ft sounding located at 55-53-10.25N, 159-09-36.32W. The sounding has been applied to the charts and is included as an 8fm 2ft sounding in HCell H11517.
- ²⁰ Concur.
- ²¹ Concur.
- ²² Concur.
- ²³ Concur. Survey modified foul area is included in HCell H11517.
- ²⁴ Concur. Survey modified foul area is included in HCell H11517.
- ²⁵ Filed with hydrographic records.
- ²⁶ Concur with clarification. Replace charted (16556) rock with nearby field verified rock at 55-52-20.916N, 159-08-16.038W.
- ²⁷ Filed with hydrographic records.
- ²⁸ Concur. Rock disproved with 100% multibeam.
- ²⁹ Filed with hydrographic records.
- ³⁰ Concur. Rock disproved with 100% multibeam.
- ³¹ Filed with hydrographic records.
- ³² Concur. Rock disproved with 100% multibeam.
- ³³ Filed with hydrographic records.
- ³⁴ Concur. Chart field verified GC rock at 55-52-06.15N, 159-07-01.146W.
- ³⁵ Filed with hydrographic records.
- ³⁶ Concur. Chart rock awash, depth unknown at charted (16556) position.
- ³⁷ Filed with hydrographic records.



³⁸ Filed with hydrographic records.

³⁹ Retain GC foul area and chart two field verified rocks, one field verified islet and adjoin survey modified (16556) intertidal area.

⁴⁰ Twelve bottom samples were collected during H11517. Only eight are included in the HCell because of redundancy after rocky seabed areas were delineated from the surface. One additional bottom sample was retained from Chart 16556.

⁴¹ Concur.

Hydrographic Survey Registry Number: H11517

Survey Title: **State:** **ALASKA**
Locality: **Southwestern Alaska Peninsula**
Sub-locality: **Chiachi Island**

Project Number: **OPR-P182-KR-06**

Survey Dates: **June – July 2006**

Depths are reduced to Mean Lower Low Water using unverified observed tides.

Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

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

DANGER TO NAVIGATION:

Feature	Depth(fms ft)	Latitude	Longitude
Rock	5 fms 4 ft	55-54-08.59N	159-07-13.05W
Sounding	8 fms 5 ft	55-53-10.25N	159-09-36.32W

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch (N/CS34) at (206) 526-6835.

H11517 HCell Report
Katie Reser, 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 ENC US4AK58M and NOAA RNC 16556.

HCell compilation of survey H11517 used Office of Coast Survey HCell Specifications Version 3.0 and HCell Reference Guide Version 1.0.

1. Compilation Scale

Depths for HCell H11517 were compiled to the largest scale chart in the region, 16556, 1:80,000 and inset 1:20,000. The density and distribution of soundings from H11517 were selected to emulate the distribution on chart 16556 and the inset. Non-bathymetric features have been generalized to chart and inset scale.

2. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 5-meter combined surface, **H11517_Combined_5m**, in CARIS BASE Editor. A shoal-biased selection was made at 1:15,000 scale for the main chart area and 1:5,000 scale for the inset area using a Radius Table file with values shown in the table, below. The resultant sounding layer contains depths ranging from 0.6 to 84.1 meters.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	150	5

In CARIS BASE Editor soundings were manually selected from the high density sounding layers 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.

3. Depth Areas and Depth Contours

3.1 Depth Areas

The extents of the highest resolution BASE Surface together with the extents of the soundings layer were used to digitize the hydrographic extents, which were then used to

create the single, all encompassing depth area (DEPARE). Two depth ranges, from 0 to 90 meters and from -2.000 to 0 meters, were used for depth area objects. Upon conversion to NOAA charting units, the depth ranges are 0 to 49.21 fathoms and -1.09 to 0 fathoms.

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

Chart Contours in Fathoms	Metric Equivalent of Chart Contours	Metric Equivalent of Chart Contours NOAA Rounded	Actual Value of Chart Contours
0	0.00	0.2286	0.00
5	5.4864	5.715	3.125
10	18.288	18.5166	10.125
20	36.576	37.9476	20.750
50	91.44	92.8116	50.750

Contours delivered in the *_SS file have not been deconflicted against shoreline features, soundings and hydrography as all other features in the *_CS file and soundings in the *_SS have been. This results in conflicts between the *_SS file contours and HCell features at or near the survey limits. Conflicts with M_COVR, M_QUAL, DEPARE, COALNE and SBDARE objects, and with DEPCNT objects representing MLLW, should be expected. HCell features should be honored over *_SS.000 file contours in all cases where conflicts are found.

Some modifications made to GC shoreline MLLW contours, to bring the GC shoreline into agreement with H11517 hydrography, necessitated inclusion of several DEPCNT features in the HCell. These 0 value contours have not been generalized. See 9.2 *Conflicts between Shoreline and Hydrography*.

4. Meta Areas

The following Meta object areas are included in HCell 11517:

M_QUAL M_CSCL
M_COVR

Meta area objects were constructed on the basis of the limits of the hydrography. (See 3.1 *Depth Areas*.)

5. Features

Shoreline features for H11517 were delivered from the field one .000 file defining new features, modification to GC or charted features, and disprovals. These were deconflicted against GC shoreline, the chart and hydrography during office processing.

During office processing, eleven submerged rocks were digitized from the high resolution BASE Surfaces.

There were two DTONs reported from survey H11517. The first DTON was a reported 5fm 4ft rock located at 55-54-08.59N, 159-07-13.05W. The rock was applied to the charts, and it is included as a submerged rock in HCell H11517.

The second DTON was a reported 8fm 5ft sounding located at 55-53-10.25N, 159-09-36.32W. The sounding has been applied to the charts and is included as an 8fm 2ft sounding in HCell H11517.

The source of all features included in the H11517 HCell can be determined by the SORIND field.

6. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

SOUNDG	Chart scale soundings
DEPARE	All-encompassing depth area and intertidal areas
DEPCNT	Zero contour for ledges and intertidal areas
COALNE	GC and charted MHW line
LNDARE	Islet features
LNDELV	Height feature for islets
UWTROC	Rock features
OBSTRN	Foul areas
WEDKLP	Kelp features
SBDARE	Bottom samples and ledges
M_COVR	Data coverage Meta object
M_QUAL	Data quality Meta object
M_CSCL	Compilation scale Meta object
\$CSYMB	Blue notes

The *_SS HCell contains the following Objects:

SOUNDG	Soundings at the survey scale density
DEPCNT	NOAA rounded contours at chart scale intervals

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 with the Blue Note information located in the INFORM field. The NINFOM field is populated with the charting disposition

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, and therefore have lower precision. 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 fathoms and feet 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 MLLW (0 fathoms) 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.
- All height units (HUNI) which have been converted to charting units, and that are 2.0 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 Junctions

H11517 junctions with survey H11518, which has already been compiled. A common junction was made between the surveys.

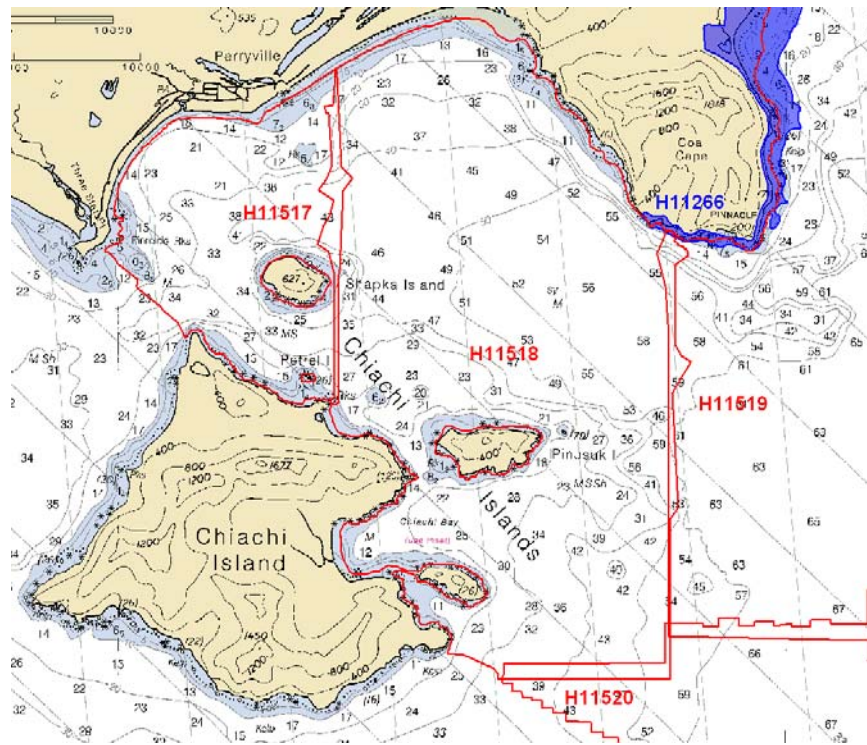


Figure 1. H11517 survey coverage

9.2 Conflicts between Shoreline and Hydrography

There are instances of GC shoreline in conflict with hydrography. These were examined using the highest resolution Surfaces. Conflicts were resolved making modifications to the GC shoreline.

10. QA/QC and ENC Validation Checks

H11517 was subjected to QA checks in S-57 Composer prior to exporting to the HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to a 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 have been approved by MCD as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11517 Base Cell File, Chart Units, Soundings compiled to 1:80,000 and 1:20,000
- H11517 Base Cell File, Chart Units, Soundings compiled to 1:15,000 and 1:5,000
- H11517 Base Cell File, Metric Units, Features compiled to 1:10,000
- H11517 Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
- H11517 Survey Outline to populate SURDEX

11.2 File Naming Conventions

- | | |
|--|---------------------------|
| • Chart units base cell file, chart scale soundings | H11517_CS.000 |
| • Chart units base cell file, survey scale soundings | H11517_SS.000 |
| • Metric base cell file, survey scale features | H11517_Features.000 |
| • Descriptive Report package | H11517_DR.pdf |
| • Survey outline | H11517_Outline.gml & *xsd |

11.3 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.1	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. 2.0	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:

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APPROVAL SHEET
H11517

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 disapproval 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.