H-11195

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.* OPR-P182-KR

*Registry No.* H-11195

## LOCALITY

*State* ALASKA

*General Locality* Southwest Alaska Peninsula

*Sublocality* Castle Bay and Northwest Arm

**2003**

**CHIEF OF PARTY**
**DEAN MOYLES**

## LIBRARY & ARCHIVES

**DATE**

NOAA FORM 77-28 (11-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTER NO.

# HYDROGRAPHIC TITLE SHEET

**H-11195**

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 **Castle Bay and Northwest Arm**

Scale **1:10,000** Date of Survey **5/9/03-6/6/03**

Instructions Dated **1/16/2003** Project No. **OPR-P182-KR-03**

Vessel **RV Quicksilver, RV Minotaur and skiff**

Chief of Party **Dean Moyles**

Surveyed by **Moyles, Arumugam, Reynolds, Orthman, Lydon, Roe, Harrison, Nadeau, et al**

Soundings taken by echo sounder, hand lead, pole **Reson 8101**

Graphic record scaled by **Thales Geosolutions Personnel**

Graphic record checked by **Thales Geosolutions Personnel**

Evaluation by **B Taylor** Automated plot by **HP Design Jet 500**

Verification by **G Nelson**

Soundings in **Fathoms and tenths** at **MLLW**

REMARKS: **Time in UTC.**

**Revisions and annotations appearing as endnotes were generated during office processing. All separates are filed with the project data. As a result, page numbering- may be interrupted or non-sequential.**

| | | |
|---|---|---|
| **Thales Geosolutions** | **LCMF** | **McLane Consulting Inc.** |
| **3738 Ruffin Road** | **139 E. 51st Ave** | **P.O. Box 468** |
| **San Diego, CA 92123** | **Anchorage, AK 99503** | **Soldatna, AK 99669** |

## A - Area Surveyed

H11195 (Sheet AG), is bounded by the coordinate listing below, and encompasses Castle Bay and Northwest Arm.[1]

Hydrographic data collection began on May 9, 2003 and ended on June 6, 2003.

**Table 1 H11195 Survey Limits**

| **Survey Limits**[2]<br>Task Order # 11<br>H11195<br>Sheet AG<br>Scale 1:10,000 | | |
|---|---|---|
| Point # | Positions on NAD83 | |
| | Degrees Latitude (N) | Degrees Longitude (W) |
| 1 | 56º14’36.253” N | 158º17’41.180” W |
| 2 | 56º14’36.168” N | 158º27’23.159” W |
| 3 | 56º10’30.112” N | 158º27’23.159” W |
| 4 | 56º10’30.112” N | 158º15’31.532” W |
| 5 | 56º11’41.965” N | 158º15’31.533” W |
| 6 | 56º14’36.253” N | 158º17’41.180” W[3] |

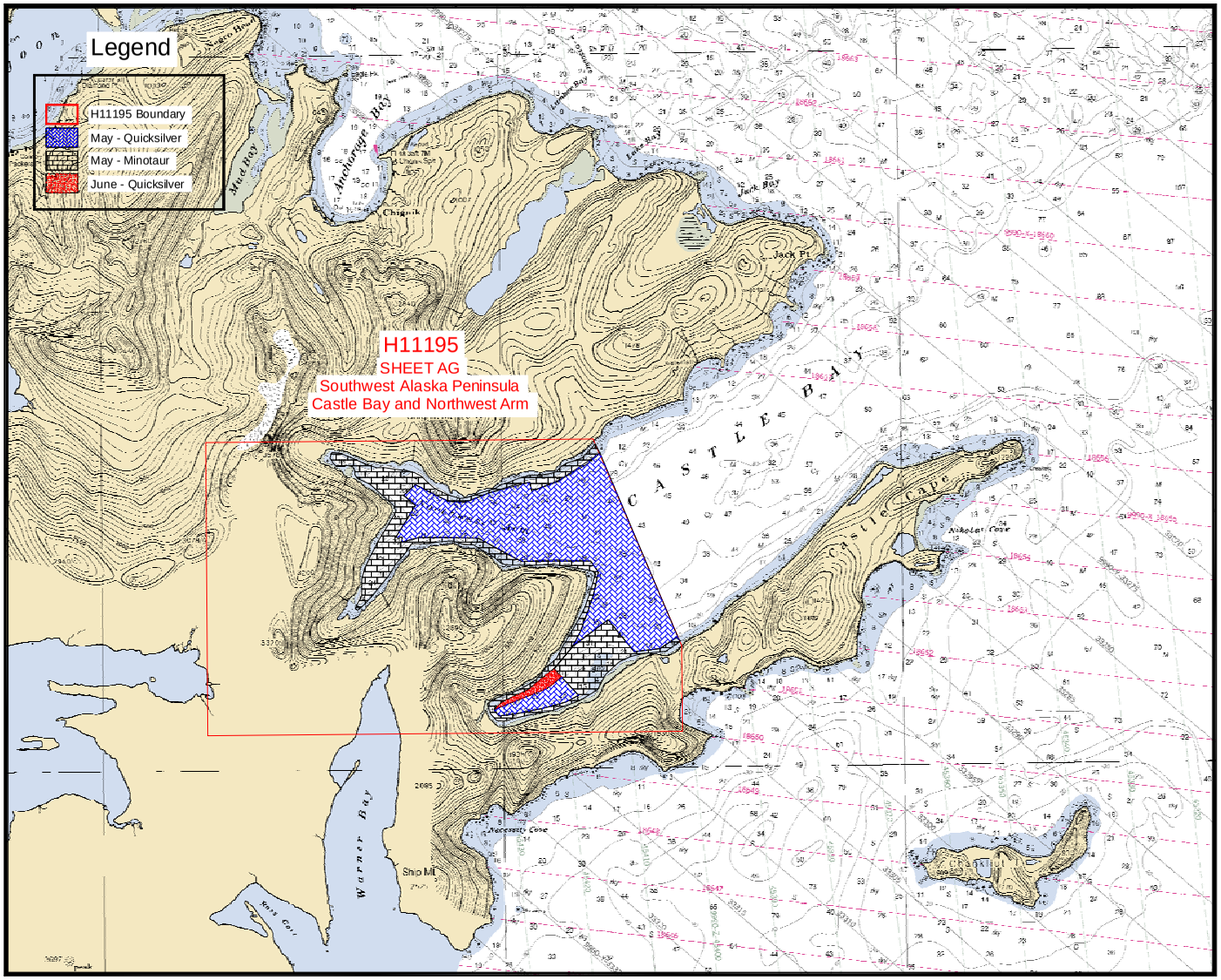


**Figure 1 H11195 Survey Limits**

## B – Data Acquisition & Processing

Refer to the OPR-P182-KR-03 Data Acquisition and Processing Report[4] 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's Quicksilver and Minotaur acquired all sounding data for H11195. The Quicksilver, which is 32 feet in length with a draft of 3 feet, was equipped with a Reson 8101 with option 033 (pseudo SideScan) for multibeam data acquisition. The vessel was also equipped with two AML sound velocity and pressure sensors for sound velocity profiles. Vessel attitude and position was[5] measured using an Applanix Position and Orientation System for Marine Vessel (POS/MV) and XTF files logged in ISIS V 6.24.

The Minotaur is 29 feet in length, with a draft of 2 feet, [6]was also equipped with a Reason 8101 with option 033 (pseudo SideScan) and two AML sound velocity and pressure sensors for sound velocity profiles. Vessel attitude and position was[7] measured using an Applanix Position and Orientation System for Marine Vessel (POS/MV) and XTF files logged in ISIS V 6.24.

Refer to OPR-P182-KR-03 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

## Quality Control

### Crosslines

Quality control tielines were planned to measure 5 percent of the main scheme line length. Total crossline length surveyed was 37.17 km (20.07 nautical miles) or 8.5 percent of the total main scheme miles. Approximately forty percent of the total line kilometers surveyed in Sheet AG were near the shoreline. It was deemed impossible to run tie lines in most of these areas. The tielines that were conducted were well distributed throughout the sheet to insure adequate crossline quality control. A total of 91 tie line crossings were examined using the CARIS HIPS Q/C report.

The majority of QC Reports fell well within the required accuracy specifications. Reports that had beams below the 95 percent confidence level are associated with the following areas and conditions:

- 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 figures below show a few examples of this.
- The accuracy of a typical DGPS unit is between 1 to 3 m, and with the constant coming and going of satellites in these areas; it was not uncommon to get a 1 to 3m-navigation jump. Although this is well within the NOS specifications, Figure 1[8] shows graphically how navigation error versus[9] vertical error can rapidly affect the specified accuracy. For example, with a 1.5m navigation error at a water depth of 25m, if the slope of the bottom is greater then 20º then the beams are outside of the 95 percent confidence level.
- Although the extreme steep slopes and/or rocks caused the majority of failed beams, another concern was SVP refraction. Due to the fresh water mixing in the area, it was virtually impossible to model the water column. To account for this, more sound velocity casts were conducted and survey line spacing decreased. The problem in most cases was not the survey lines but the tielines. The tielines may have used an SVP cast that was one or two kilometers away, causing cupping in the outer beams and thus not achieving the 95 percent confidence level.[10]

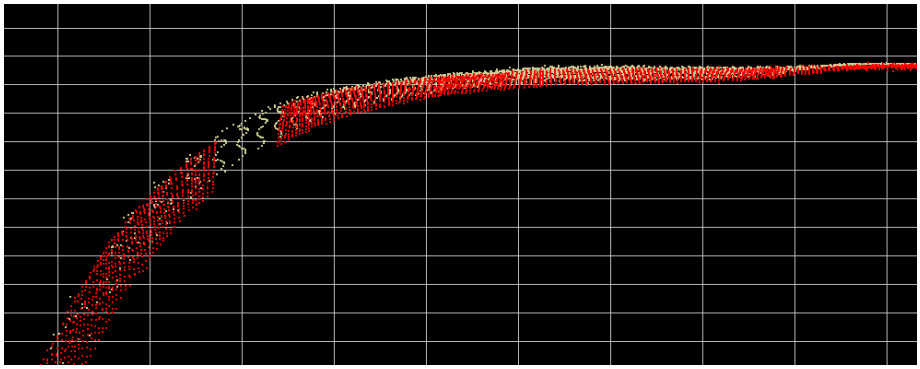

**Figure 2: Profile of AG08-QC009**

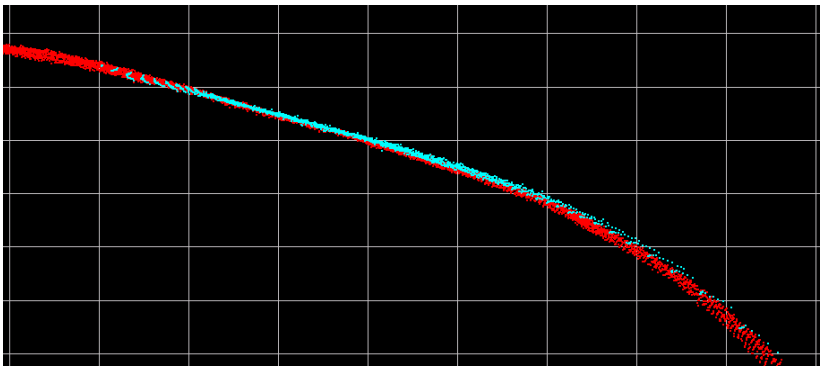

**Figure 3: Profile of AG09-QC002**

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 defined in the makehist.cla file within CARIS will use:

$$a = 0.5*\sqrt{2} = 0.707$$
$$b = 0.013*\sqrt{2} = 0.018$$

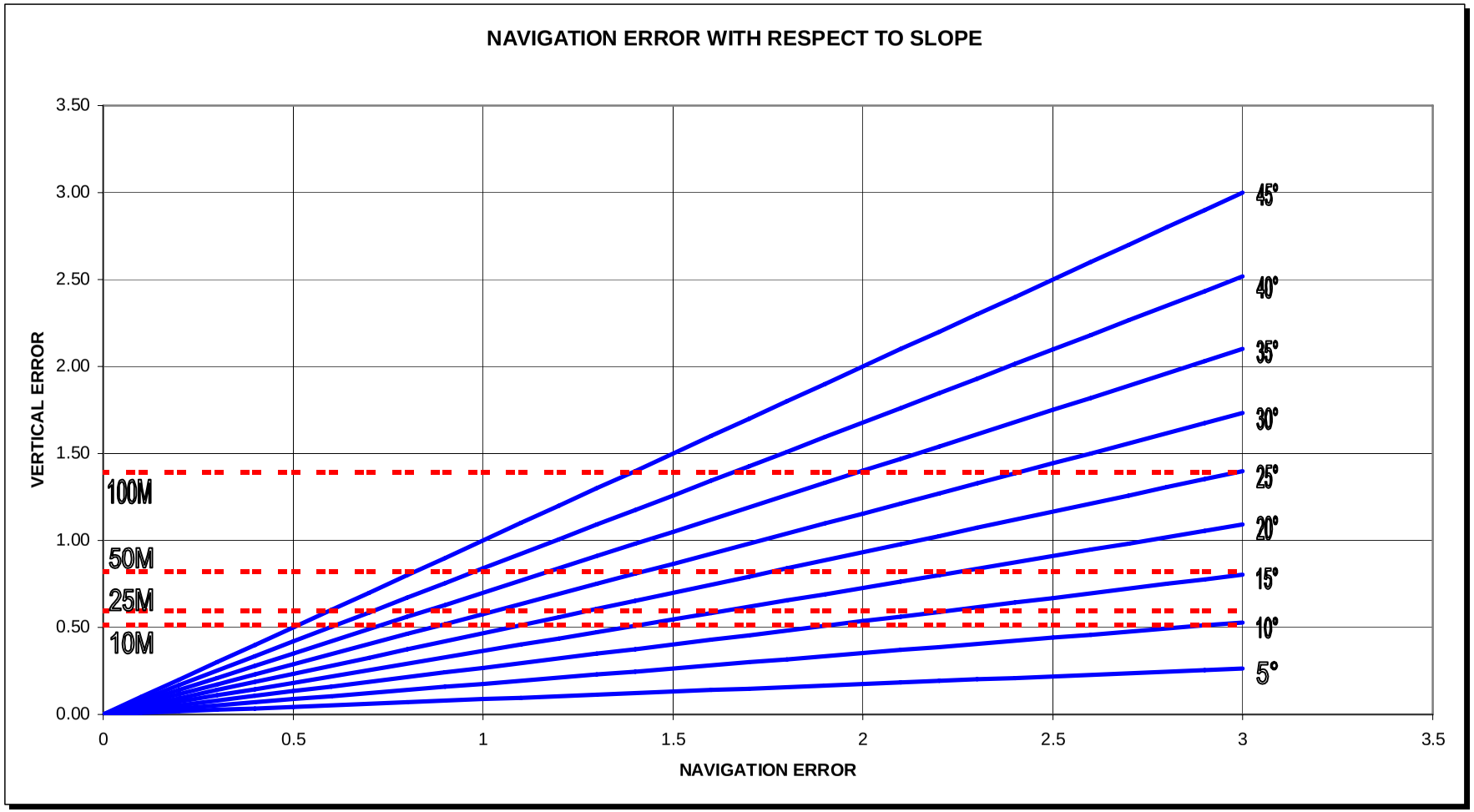


**Figure 4: Navigation Error With Respect to Slope**

## Data Quality

In general the multibeam data quality for H11195 was excellent, but it should be noted that certain areas were influenced by fresh water runoff. During the survey and routine processing, a general downward and/or upward cupping was noticed in the sounding data. This problem was resolved by conducting more sound velocity casts and by decreasing the survey line spacing.[11]

It should be noted that certain areas were deemed unsafe for navigation, due to the steep and over hanging cliffs and falling rocks; therefore data to the 4m contour was not achieved[12].

## Survey Junctions

H11195 (Sheet AG) junctions with:

| Registry # | Scale | Date | Junction Side |
|---|---|---|---|
| H11192 | 1:10,000 | 2003 | West[13] |

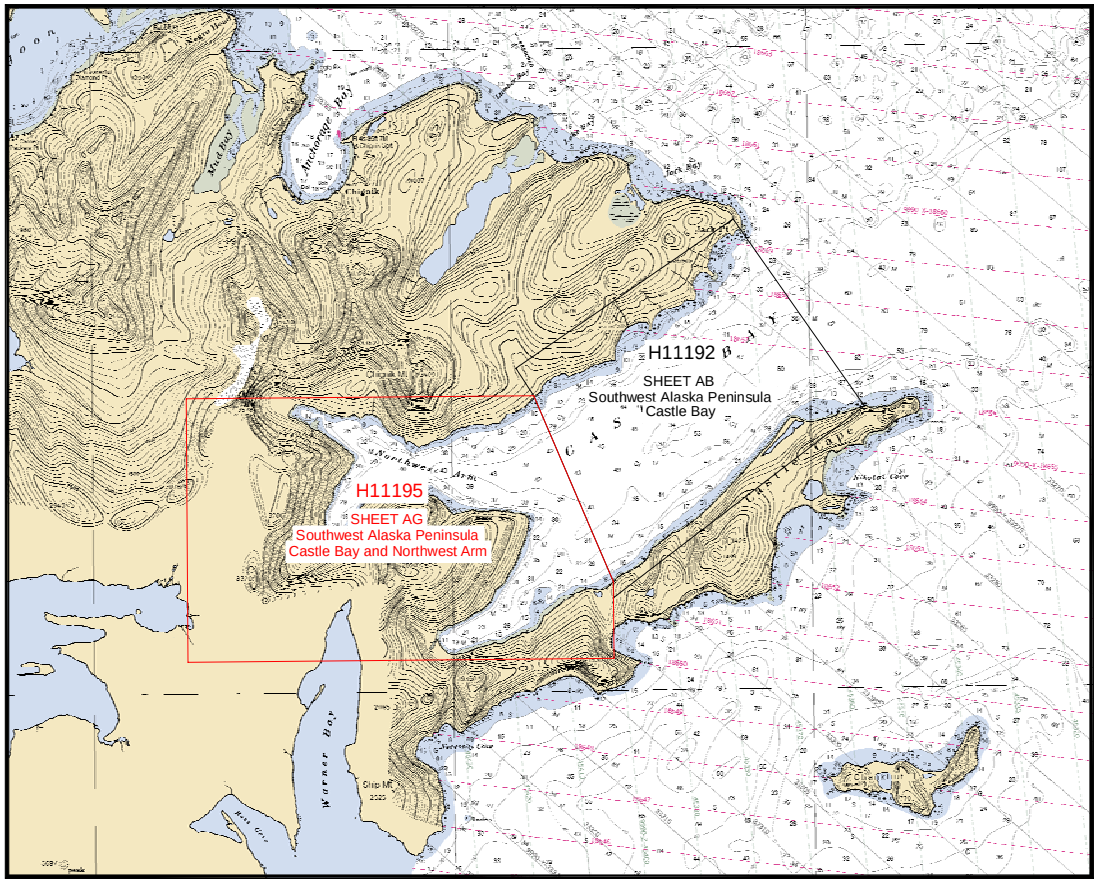


**Figure 5 H11195 Survey Junctions**

The surveys are in agreement along their common borders.[14] The agreement was noted in the field using the 2-meter DTM's created for coverage verification. The conformity is also apparent in their preliminary smooth sheets.

Smooth Sheet Histograms

Figure 5[15] Histogram is for the Reson 8101 data collected from May 17, 2003 to June 4, 2003 on the Quicksilver. This histogram shows a number of distinct features, one being the valley around the nadir beams. [16]A result of nadir penetration, which is a common feature with Reson 8101 data. This is a result of turning the power high enough to receive an accurate detection on the outer beams as well as being a function of bottom type. The majority of lines collected had a noticeable sample of nadir beams that had deeper depths than the surrounding soundings. These typically did not have any significant structure and were flagged as noise in CARIS HIPS & SIPS. Since these were rejected, soundings from the adjacent beams were selected instead causing the spikes around beams 43 and 61. The decrease of selected soundings on the outer beams is the result of deterioration of data quality on the outer beams, especially in deep water. In most cases set filters were used to flag the outer beams as rejected, but in other cases additional cleaning or filters were used on a line by line bases[17] resulting in fewer selected soundings

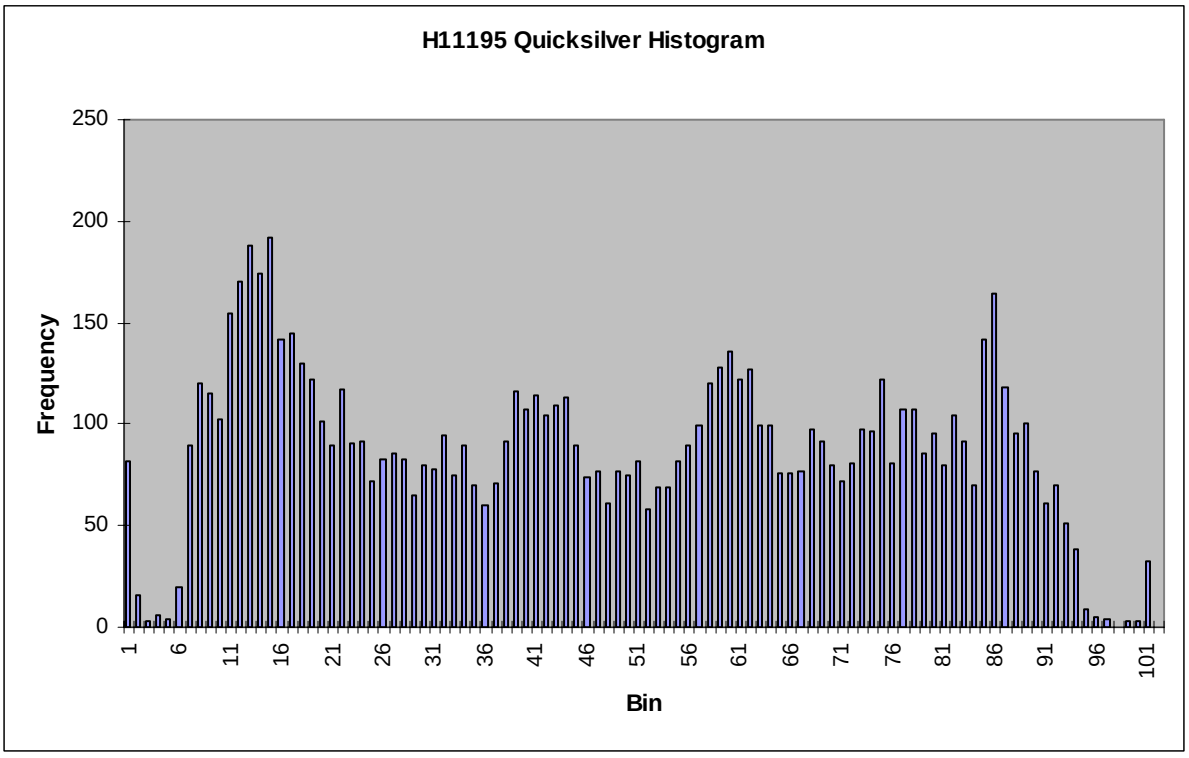


**Figure 6 Histogram for 8101 (Quicksilver)**

Figure 6[18] Histogram is for the Reson 8101 data, collected from May 9, 2003 to June 6, 2003 on the Minotaur. The histogram shows an increase on[19] selected soundings from the outer beam on the starboard side. This is the result of surveying near the shoreline and the simple fact that the outer beams are the shallowest. This does not appear to be the result of equipment failure, survey or processing procedures. Inspection of the smooth sheet reveals trends where this beam is shoaler than the rest of the profiles simply because it is up slope from all other soundings. The crossline comparisons revealed that these beams[20] were within IHO specifications; any differences were only a few centimeters.

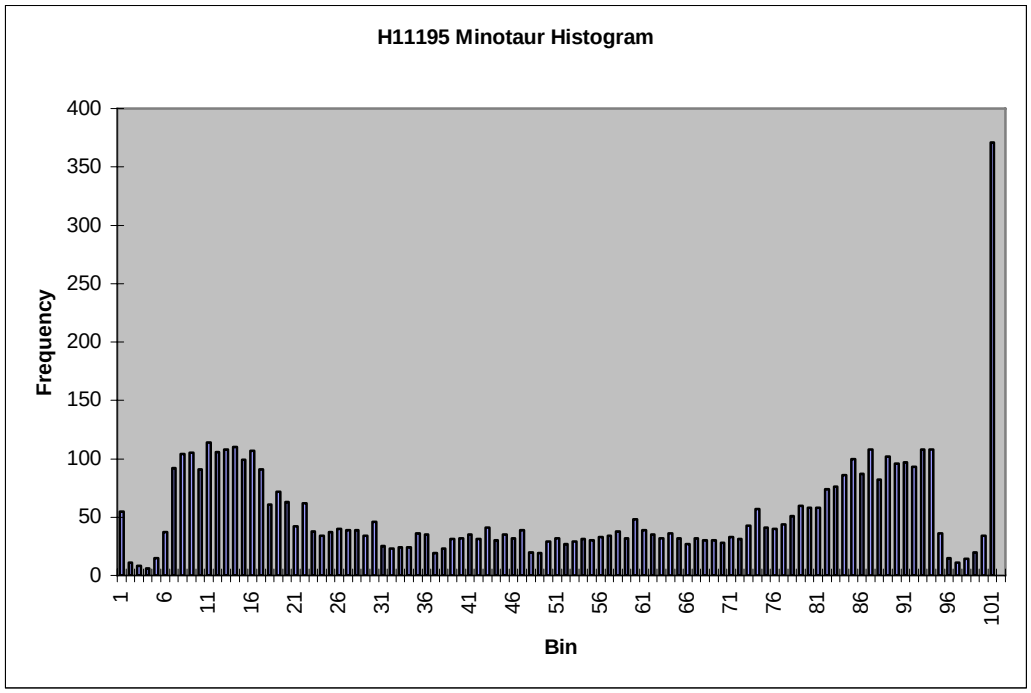


**Figure 7 Histogram for 8101 (Minotaur)**

Quality Control Checks

During the hydrographic survey OPR-P182-KR-03 the R/V's Quicksilver and Minotaur conducted a number of confidence checks. This[21] usually consisted of the vessels running two lines in the opposite direction[22] over a reference surface (usually the patch test site). The Reson 8101 systems that were installed on the Quicksilver and Minotaur usually compared to within 5 to 10 centimeters.

Positioning system confidence checks where[23] conducted on a daily basis. The POS/MV 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 2000) 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.

Corrections to Echo Soundings

Refer to the OPR-P182-KR-03 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings. No deviations from the report occurred.

## C – Horizontal & Vertical Control

Refer to the OPR-P182-KR-03 Horizontal and Vertical Control Report[24] for a detailed description of the horizontal and vertical control used on this Survey. A summary of the projects[25] 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 positions were originally collected in WGS84 and transformed to NAD83 during HIPS workfile creation. Projection of smooth sheet is in NAD83, UTM [26](Central Meridian 159º00'00").

Two MBX-3 differential receivers that used the U.S. Coast Guard (USCG) network of differential beacons were the main source of RTCM. Two remote base stations were installed to broadcast differential corrections to the vessels in remote areas of the survey. These stations were installed and maintained by LCMF, and were located in Northwest Arm and Chankliut Island. Refer to the OPR-P182-KR-03 Horizontal and Vertical Control Report for DGPS verification results.

Vertical Control

All sounding data were reduced to MLLW initially using unverified tidal data from one tide station located in Castle Bay. A sub-contractor, LCMF, operated the gauge and the data was emailed to the R/V Davidson at the end of every Julian day.

**Table 2 Tide Gauge**

| Gauge | Model | Gauge Type | Location | Latitude | Longitude | Operational |
|---|---|---|---|---|---|---|
| 9458907 | H350/355 | Digital Bubbler | Castle Bay | 56º13'53"N | 158º20'47" W | 04/25/03–06/07/03 |

On July 9, 2003, LCMF issued verified tidal data and final zoning for OPR-P182-KR-03 and all sounding data was re-merged. For the Preliminary Smooth Sheet verified tidal data were used. Refer to the Vertical and Horizontal Control Report for additional tidal information and station descriptions.

## D – Results and Recommendations

Chart Comparison[27]

H11195 survey was compared with charts:

- 500 1:3,500,000 7th June 1, 1996
- 16011 1:1,023,188 35th Dec 2, 2000
- 16013 1:969,761 28th Apr 14, 2001
- 16566 1:77,477 10th Feb 20, 1999

Comparison of Soundings

The soundings in general compare well with the existing charts.[28] Areas of differences to note are[29]:

- Hydrographic survey H11195 revealed a depth of 25 fathoms in the vicinity of a 28 fathom sounding on chart 16566 located at 56º14'04.827" N, 158º22 54.715" W (538317.487 E, 6232370.503 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11195 revealed a depth of 29 fathoms in the vicinity of a 32 fathom sounding on chart 16566 located at 56º13'54.152" N, 158º 22'26.989" W (538797.907 E, 6232044.784 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11195 revealed a depth of 29 fathoms in the vicinity of a 33 fathom sounding on chart 16566 located at 56º13'12.168" N, 158º 22'37.796" W (538623.527 E, 6230745.109 N). This area was surveyed with 100% multibeam coverage.

- Hydrographic survey H11195 revealed a depth of 36 fathoms in the vicinity of a 40 fathom sounding on chart 16566 located at 56º13'28.598" N, 158º 21'22.958" W (539907.909 E, 6231264.918 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11195 revealed a depth of 25 fathoms in the vicinity of a 38 fathom sounding on chart 16566 located at 56º13'43.614" N, 158º 20'12.447" W (541117.876 E, 6231740.673 N). This area was surveyed with 100% multibeam coverage.

Soundings that differ from hydrographic survey H11195 are highlighted in red on the chart comparison sheet included in Separate 6. Other soundings that differed resulted in a Danger to Navigation and are listed in Appendix A Danger to Navigations.[30]

Since Charts 16011 and 16013 have little or no detail pertaining to the contours, the hydrographer compared the contours from H11195 to Chart 16566.

The contours from H11195 compare well with the existing charted contours, but as illustrated in figure 8 below it is evident that some shoaling and deepening as[31] occurred.[32]

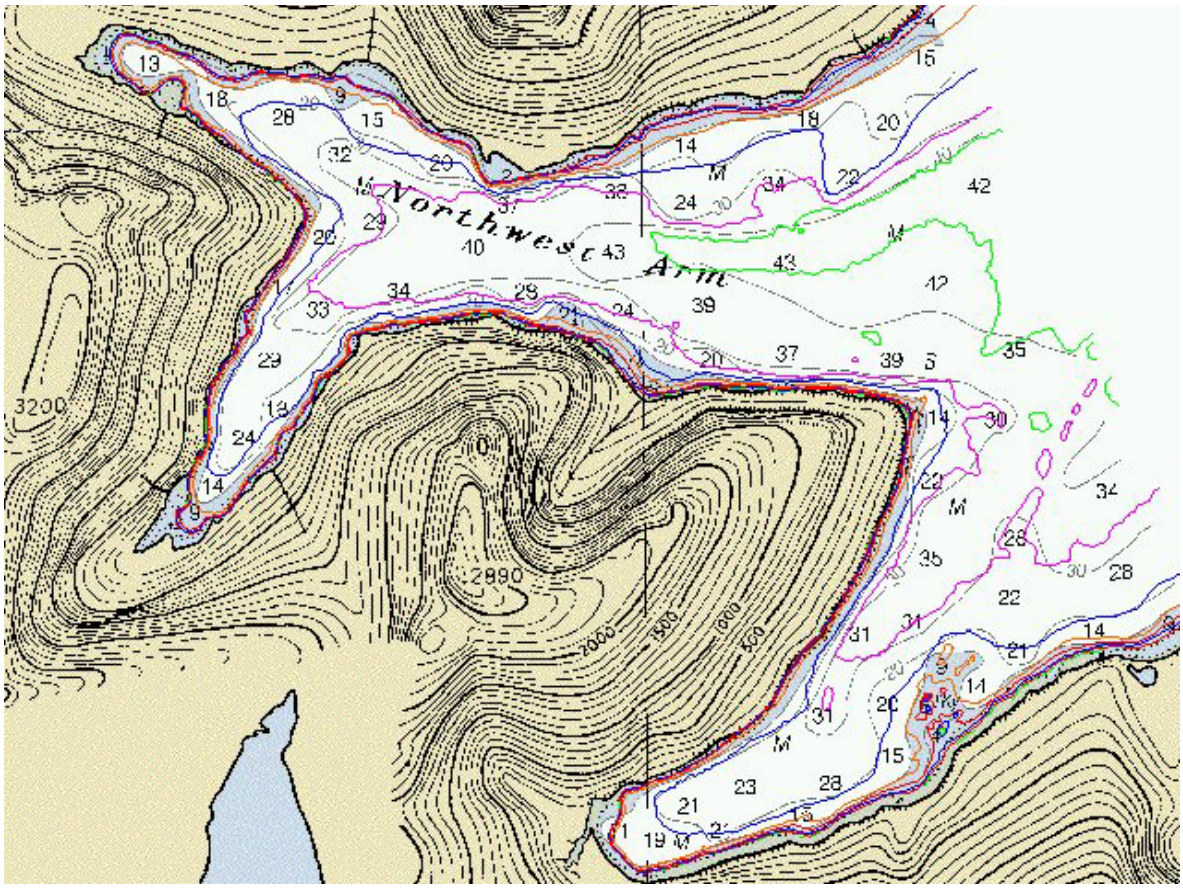


**Figure 8 Comparison of Contours**

Automated Wreck and Observation Information System

There were no AWOIS items assigned to OPR-P182-KR-03.[33]

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11195.[34]

Dangers to Navigation

Eight dangers to navigation were located during the hydrographic survey of H11195 and were submitted on August 12, 2003. Refer to Appendix A[35] for Submitted Report.

## Additional Results

Shoreline Verification

Limited shoreline verification was conducted in accordance with SOW 3.4.2 for remote sensing features inshore of the 4-meter curve, including the MHW line. Traditional shoreline verification was conducted in accordance with SOW 3.4.3 for remote sensing features seaward of the 4-meter curve or the limit of safe navigation. The 4-meter curve was determined from H11195 multibeam data, where present, and at the hydrographer's discretion in areas where no multibeam data was available.

A 19 ft. skiff, referred to as DP Skiff, was used to perform shoreline verification. The skiff was owned by John Oswald Consulting and piloted by Mike Ziersal or Erik Oppegard. The skiff was also tasked with tides and DGPS station support. The DP skiff could generally safely navigate in any area where it could maintain 0.5 meters of under-keel clearance, except in locations of heavy swells near shore. The DP skiff was outfitted with a Garmin GPSMAP 176C differential GPS receiver and a WINFROG data acquisition system. NOAA supplied Thales with photogrammetric shoreline data in raster format for TP-00913 for use as source shoreline. The T-sheet raster image was registered in ERMapper and digitized in AutoCAD by Thales personnel and the resultant vector data were used in WINFROG for field verification. In addition, the multibeam 4-meter curve and CH 16566 was[36] displayed as a layer in WINFROG for reference when available. A leadline was used to take soundings on submerged features. Other source data supplied by NOAA included the Mean High Water line and point features file (often small islets) AK209 as well as a shoreline file labeled "102". All were compared to the survey area.

Traditional verification of remote sensing offshore features was generally performed within two hours of predicted low water. Traditional verification of remote sensing offshore features was performed by running along the 4-meter curve and taking Detached Positions (DPs) on any feature observed near, on, or off-shore of the 4-meter curve. Although the SOW only

required that new features observed were to be noted and recommended for additional investigation, all new features actually observed near, on, or off-shore of the 4-meter curve were immediately investigated with a DP. Observed features included exposed rocks, reefs, ledges, and islets, as well as submerged features indicated by visual sightings in clear water, kelp patches, and surface action. DPs and their corresponding hydrographer's remarks were digitally recorded in WINFROG. Digital photographs were taken for features when feasible. However, photographs were not taken on features that were submerged beneath the water's surface at the time of the DP. Digital photographs (in addition to the correlation sheet / DP form) were favored over sketches in order to increase efficiency during the limited low tide windows. However, some hand-drawn sketches were also taken in complicated areas. A DP form for each DP was digitally produced from the WINFROG file. The DP form also includes the digital photograph, if taken, and shows the DP overlaid onto the largest scale chart, the vector shoreline data, and associated multibeam coverage. DP forms are included under the Reports directory on the project CD's.[37]

It should be noted that large rocks, generally greater than 20m in size, often received at least 2 DPs, with a DP taken at each physical extent. The physical extents of DP'd rocks were also often outlined as corresponding gaps in associated multibeam coverage. In such instances, the corresponding smooth sheet rock symbol may have been placed in the center of the extents as defined by DPs and/or the gap in multibeam coverage. Details as to how each DP was placed on the smooth sheet are provided on the DP forms.

Limited verification of the MHW line was generally performed during periods of high tide. The general location of the MHW line was determined by running as close to the shoreline as possible, generally 30-60 meters offshore, and periodically recording an EVENT in WINFROG approximately every 10-45 seconds. A range finder was used to take a more accurate range to the estimated MHW line. This range and approximate azimuth to the shoreline were written in the EVENT comment. A typical comment might be "HWL 30m N". Taking an EVENT digitally recorded the vessel's time and position and the hydrographer's remarks. In areas that the HWL was too complicated to trace with the skiff but appeared to match the general location (GL) of the source data to within 20m, comments such as, "GL HWL OK" were entered. In areas where there appeared to be a potential discrepancy, remarks typically described the location of the apparent MHW line in reference to the skiff at the time of the EVENT. EVENTS were plotted during office review and then a sketch of the shoreline based on the information within each event was created. This was then overlaid onto H11191[38] multibeam coverage plots, T-sheets, digital manuscript data, and affected charts for final MHW verification. DP Forms were not produced for EVENTS and EVENTS are not depicted on the DP plot, however, EVENTS are provided in a supplemental AutoCAD file.[39]

Limited verification of remote sensing features inshore of the 4-meter curve was performed concurrently with both limited verification of the MHW line (performed at mid-high tide) and traditional verification of offshore features (performed at low tide). EVENTS were taken to record hydrographer's remarks for most inshore features. Typical remarks included "DM rk ok" and "DM rk not seen". It should be noted that in such instances, the skiff's location, and therefore the EVENT position, was often at a significant distance (> 20 meters) away

from the actual location of the inshore feature. The EVENTS for features inshore of the 4-meter curve were plotted during office review and compared to the multibeam coverage, T-sheets, and the chart. If a feature inshore of the 4-meter curve appeared to be inadequately located on the remote sensing source, it is listed as a recommendation for additional item investigation. Although it was not required by the SOW, some select inshore features were investigated by traditional verification (i.e. coming alongside the feature and recording a DP and photograph) when it was determined by the hydrographer that doing so had minimal operational impact on collecting required DPs.

All sections of the source MHW line that were within the survey area and were determined to be in the correct general location (within 20 meters) by means of limited shoreline verification are shown on the smooth sheet in black.[40] The largest change that was noted was that many point features in the source data were actually small islets. The source MHW line compared very well to field verification observations and the smooth sheet shows only a few changes that are itemized below:

1. New islet (3 ft ht MHW), at 56 12 10.18 N, 158 23 55.37 W (X = 537304.06 Y = 6228816.77) was positioned by DP#149_01. This feature is depicted as a rock on AK0209. However, this survey found the DM point feature position to be the high point of a charted islet 10m diameter centered on the DM point.[41]
2. New islet (12 ft ht MHW), at 56 11 36.30 N, 158 16 19.62 W (N6227845.08, E545169.05) was positioned by DP# 149_05.[42]

Features that are itemized and discussed are as follows:

1. DP'd rocks found more then[43] 20m from the correlating T-sheet rock. T-sheet rock is considered disproved and rock is considered "new" and shown at DP position.
2. T-sheet rocks that have been disproved.
3. Charted rocks that have been disproved

Source Data – Disprovals and Exceptions (from TP-00913 and AK209)

1. DM rock at 56 14 19.29 N, 158 18 19.45 W (N6232862.80, E543052.73) was found by DP# 129_28 to be a ledge extending seaward from the MHW line.[44]

Charted Shoreline - Disprovals and Exceptions (from CH 16566)

Charted rocks within the survey limits were generally identified to correspond with a smooth sheet rock, or cluster of smooth sheet rocks. In the survey area foul areas were often charted as strings of rock symbols. Upon investigation of some of these areas it was not possible to prove or disprove the individual symbols, and [45]appear as foul areas on the smooth sheet.

It should be noted that charted rock symbols are often centered at positions up to 200m away from their corresponding smooth sheet rocks. Charted rock symbols within the survey limits

were generally disproved at their centered positions with multibeam coverage, and/or, by DPs taken on actual highpoints observed in the area during shoreline verification. It is recommended that existing charted rock symbols within the survey limits be removed, and features be charted in these areas based on the position of features shown on the smooth sheet.[46]

In areas where the multibeam data indicated an isolated submerged rock of navigational significance, an "Rk" text label was placed adjacent to selected sounding (multibeam least depth) on the smooth sheet. In areas where the multibeam data indicated a submerged rocky bottom with numerous high points, an "rky" text label was placed in the area on the smooth sheet.[47]

No charted rock disprovals or exceptions were found during shoreline verification for H11195.

## Tidal Range

LCMF established the tidal range for OPR-P182-KR-03 Castle Bay to be 2.441 meters (8.009 feet or 1.335 fathoms). This value was used in determining height above MHL.[48]

Shoreline Correlator Sheet

ArcMap v8.2 with the Shoreline Correlator add-on, written by the Thales GeoSolutions (Pacific) Inc. GIS department, aided in the processing of the Shoreline Verification 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), T-Sheet Data, Smooth Sheet Soundings and Multibeam Coverage files to calculate and display the desired information for each DP. Figure 9 shows an example of a DP form produced from the Correlator. The DP forms and raw field notes can be found on the Project CD under the Reports Directory.[49]

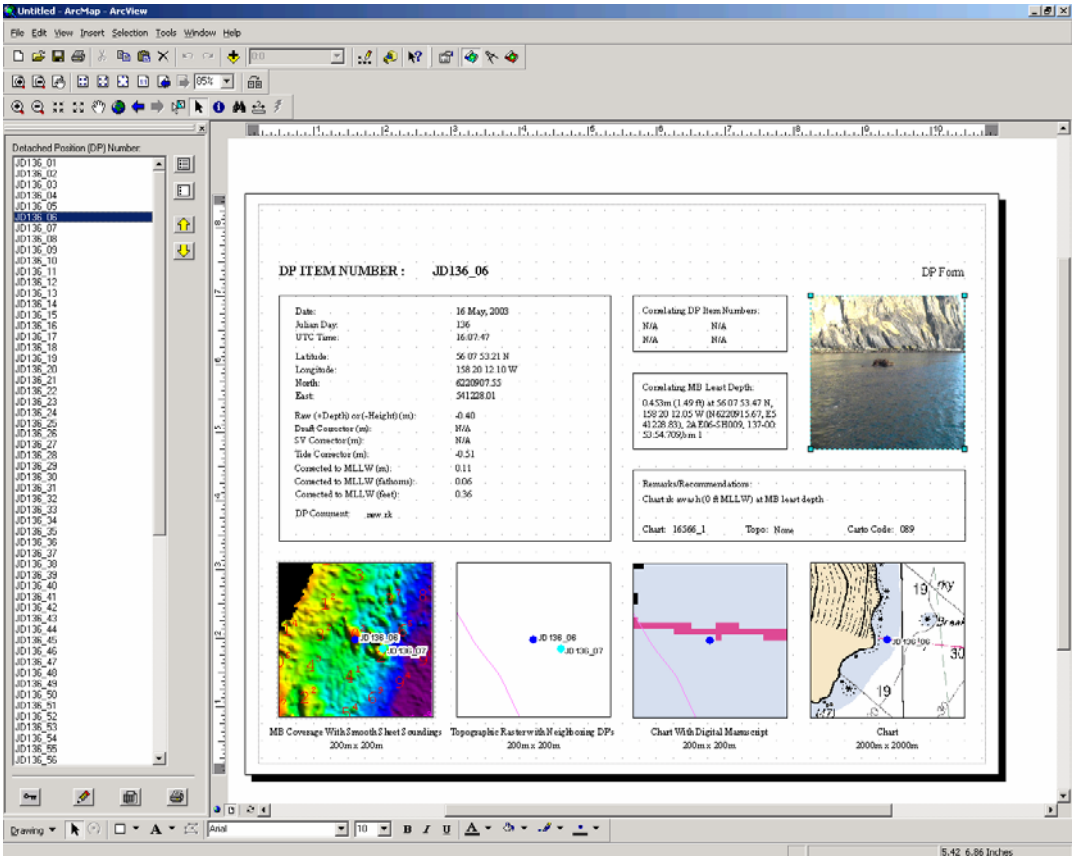


**Figure 9 DP Correlator Sheet**

Bottom Samples

Bottom Samples were not required under this contract.[50]

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.[51]

## E – Approval Sheet

### Approval Sheet

For

### H11195

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

OPR-P182-KR-03 statement of work and hydrographic manual;
Thales GeoSolutions (Pacific) Inc. Acquisition Procedures (2003-NOAAAcquisitionProcedures);
Thales GeoSolutions (Pacific) Inc. Processing Procedures (2003-NOAAProcessingProcedures);
Technical Report for Tides, Castle Bay.

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

The data were reviewed daily during acquisition and processing.

Approved and forwarded,

Dean Moyles, Thales GeoSolutions (Pacific) Inc.
Lead Hydrographer
TGP Survey Party

## Appendix A - Danger to Navigation

Eight dangers to navigation were located during the hydrographic survey of H11195.

**Danger to Navigation Report**

**Hydrographic Survey Registry Number**: **H11195**

**Survey Title: State: Alaska Locality: Southwest Alaska PeninsulaSub-locality: Castle Bay and Northwest Arm**

**Project Number: OPR-P182-KR-03**

**Survey Dates: May - June 2003**

Depths are reduced to Mean Lower Low Water using verified tides. Positions are based on the NAD83 horizontal datum.

**CHARTS AFFECTED:**

| Chart | Scale | Edition | Date |
|---|---|---|---|
| 500 | 1:3,500,000 | 7th | 06/01/96 |
| 16011 | 1:1,023,188 | 35th | 12/02/00 |
| 16013 | 1:969,761 | 28th | 04/14/01 |
| 16566 | 1:77,477 | 10th | 02/20/99 |

**DANGERS:**

| Feature | Depth(ft or fms) | Latitude (N) | Longitude (W) |
|---|---|---|---|
| Sounding | 7 1/4 fms | 56° 14' 19.1" | 158° 23' 37.8"[52] |
| Sounding | 5 3/4 fms | 56° 12' 57.5" | 158° 20' 07.5"[53] |
| Sounding | 7 1/2 fms | 56° 12' 46.1" | 158° 17' 43.2"[54] |
| Sounding | 3/4 fms | 56° 10' 48.9" | 158° 20' 18.4"[55] |
| Sounding | 9 fms | 56° 10' 52.3" | 158° 18' 42.8" |
| Rock | 0 fms | 56° 11' 15.0" | 158° 17' 36.0" |
| Rock | 1 fms | 56° 11' 24.5" | 158° 17' 43.3"[56] |
| Sounding | 6 1/2 fms | 56° 11' 35.2" | 158° 17' 35.1"[57] |

**COMMENTS:**

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

## Appendix B - List of Geographic Names

No new geographic names in the survey were discovered.[58]

# Appendix C – Progress Sheet

# PROGRESS SKETCH

Start Date: 5/1/03
End Date: 6/7/03
Submitted Date: N/A

OPR-P182-KR-03
Southwest Alaska Peninsula
Vicinity of Castle Cape
Thales GeoSolutions (Pacific) Inc.

Dean Moyles, Lead Hydrographer
Chart 16566

| Sheet | Month | DAS | LNM | SQNM | SVP Casts | Bottom Samples | AWOIS Completed | No. of Tide Gauges | Diff. Stations | Weather Downtime | Equipment Downtime |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sheet AA | May | 11 | 296.94 | 18.04 | 57 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AB | May | 19 | 319.31 | 13.57 | 67 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AC | May | 13 | 310.07 | 12.20 | 73 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AE | May | 14 | 324.57 | 14.42 | 79 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AG | May | 13 | 218.12 | 7.81 | 82 | 0 | 0 | 1 | 3 | N/A | N/A |
| | | | | | | | | | Total: | 4.08 | 0.63 |

| Sheet | Month | DAS | LNM | SQNM | SVP Casts | Bottom Samples | AWOIS Completed | No. of Tide Gauges | Diff. Stations | Weather Downtime | Equipment Downtime |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sheet AA | June | 3 | 19.27 | 0.76 | 15 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AB | June | 6 | 16.55 | 0.45 | 13 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AC | June | 5 | 43.21 | 1.54 | 21 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AE | June | 3 | 27.29 | 0.61 | 16 | 0 | 0 | 1 | 3 | N/A | N/A |
| Sheet AG | June | 4 | 19.43 | 0.45 | 19 | 0 | 0 | 1 | 3 | N/A | N/A |
| | | | | | | | | | Total: | 2.17 | 0.08 |

H11191
SHEET AA
SOUTHWEST ALASKA PENINSULA
JACK BAY AND CASTLE BAY

H11192
SHEET AB
SOUTHWEST ALASKA PENINSULA
CASTLE BAY

H11195
SHEET AG
SOUTHWEST ALASKA PENINSULA
CASTLE BAY AND NORTHWEST ARM

H11193
SHEET AC
SOUTHWEST ALASKA PENINSULA
CASTLE BAY AND NIKOLAI COVE

H11194
SHEET AE
SOUTHWEST ALASKA PENINSULA
CASTLE CAPE AND NECESSITY COVE

**Legend**

- Sheet AA Limits
- Sheet AB Limits
- Sheet AC Limits
- Sheet AG Limits
- Sheet AE Limits
- May-Minotaur
- May-Quicksilver
- June Quicksilver

Note: LNM and SQNM for June are in-fills and re-runs.

# Appendix D - Tides and Water Levels

# 2003 FIELD and FINAL TIDE NOTE

## Registry Number: H11195

### Sheet AG

### Castle Bay and Northwest Arm

### SW Alaska Peninsula

| | |
|---|---|
| NOAA Project No: | OPR-P182-KR-2003 Alaska |
| NOAA Contract No: | 50-DGNC-0-90017 |

The Sand Point, Alaska tide station (945-9450) served as control for the subordinate stations for this project. Datum determinations were made for the primary subordinate station at Castle Bay (949-8907). The NTDE 1983 - 2001 was utilized.

| | | | | | | |
|---|---|---|---|---|---|---|
| Location and Time Meridian | Name: | Lat (NAD 83) | Long (NAD 83) | Time Meridian: | | |
| | Castle Bay: | 56° 13' 54" | 158° 20' 48" | 0° (UTC) | | |
| Time Period and Datum Reference | Name: | Established: | Removed: | MLLW | MHW | units |
| | Castle Bay: | 4/25/2003 | 6/7/2003 | 0.000 | 2.441 | meters |
| | | | | *NOS Published Datum* | | |

| | |
|---|---|
| Tide observer | John Oswald & Associates LLC (JOA)<br>12001 Audubon Drive<br>Anchorage, Alaska 99516<br>(under subcontract to LCMF, LLC and Thales GeoSolutions, Anchorage, AK) |
| Gauges | Design Analysis H350/355 bubbler systems. |
| Installation | Each gauge was secured inside a waterproof case, and fastened vertically to a wooden brace above the high water line. A tent covered each gauge installation .<br><br>Refer to the tide station packages for additional site specific details of installation. |
| Tide staff | None. Spirit leveling was observed between a nearby tidal bench mark and the water. The survey rod was outfitted with a stilling well to dampen wave action. |
| Benchmarks | The following benchmarks were recovered at this site:<br><br>Castle Bay: 8907 A 2001, 8907 B 2001, 8907 C 2001, 8907 D 2001, 8907 E 2001<br>NGS Triangulation Station NEW (PID# UW1335), NEW RM 1 1924 |
| Levels | Benchmarks were leveled at the installation and removal of each tidal station. The benchmarks and station datums were connected through frequent leveling to the water. The level runs closed within NOS tolerance. Benchmarks were stable. |
| Final Tidal Zoning | The final tidal zoning follows this report. This zoning is the same as the final tidal zoning developed by LCMF in 2001 for NOS Project OPR-P182-KR-2001. |
| Reduction of Hydrographic data | Thales GeoSolutions (the prime contractor) was provided published NOS datums by JOA during May 2003 and MLLW correctors throughout the field season. In July 2003, JOA verified the datums using tide data from this field season, and forwarded all data necessary to reduce hydrographic soundings to the prime contractor. |

## Appendix E - AWOIS

No AWOIS were assigned under OPR-P182-KR-03.[59]

# Revisions Compiled During Office Processing and Certification

[1] Concur.
[2] Concur with clarification. The approximate limits of hydrography are:
- Lat 56/14/43.4N and Lon 158/17/18.0W
- Lat 56/11/49.6N and Lon 158/15/23.5W
- Lat 56/10/48.3N and Lon 158/20/21.1W
- Lat 56/12/12.2N and Lon 158/23/53.3W
- Lat 56/14/29.6N and Lon 158/24/19.1W

[3] Concur with clarification. Point 6 is the same position as Point 1.
[4] Filed with the project reports.
[5] Strikethrough ~~was~~, replace with "were".
[6] Insert "and".
[7] Strikethrough ~~was~~, replace with "were".
[8] Strikethrough ~~1~~, replace with "4".
[9] Strikethrough ~~versus~~, replace with "combined with".
[10] The data is adequate for charting.
[11] Concur. H11195 is adequate to supersede all prior surveys and miscellaneous source data except as noted in this report and the Hdrawing.
[12] Insert "in these areas".
[13] Strikethrough ~~West~~, replace with "East".
[14] Concur.
[15] Strikethrough ~~5~~, replace with "6".
[16] Insert "The valley is".
[17] Strikethrough ~~bases~~, replace with "basis".
[18] Strikethrough ~~6~~, replace with "7".
[19] Strikethrough ~~on~~, replace with "in".
[20] Strikethrough ~~beams~~, replace with "soundings".
[21] Strikethrough ~~This~~, replace with "These".
[22] Strikethrough ~~the majority of lines were run~~, replace with "in the majority of lines run".
[23] Strikethrough ~~where~~, replace with "were".
[24] Filed with the project reports.
[25] Strikethrough ~~projects~~, replace with "project's".
[26] Insert "Zone 4".
[27] In PHB processing, H11195 was also compared with Chart 16566, 11th Edition, continuous maintenance raster.
[28] Concur.
[29] The evaluator concurs with the hydrographer's chart comparisons listed below. Chart all areas according to the smooth sheet.
[30] Strikethrough ~~Danger to Navigations~~, replace with "Dangers to Navigation". Attached to this report.
[31] Strikethrough ~~as~~, replace with "has".
[32] Concur with clarification. Errors occurred in the depiction of contours on the smooth sheet. Chart contours as depicted on the Hdrawing.
[33] Concur.

[34] Concur.
[35] Attached to this report.
[36] Strikethrough ~~was~~, replace with "were".
[37] Filed with the project reports.
[38] Strikethrough ~~H11191~~, replace with "H11195".
[39] Filed with the project reports.
[40] Verified RSD MHWL is shown on the Hdrawing in blue.
[41] Concur with clarification. The islet is depicted as a rock on Chart 16566, 11th Edition, continuous maintenance raster. Chart islet according to the smooth sheet.
[42] Concur. Chart islet according to the smooth sheet.
[43] Strikethrough ~~then~~, replace with "than".
[44] Concur. Chart according to the smooth sheet.
[45] Strikethrough ~~appear as~~, replace with "their former positions are included in".
[46] Concur with clarification. As stated, individual charted rocks were not verified in foul areas. Therefore, where no smooth sheet rock is depicted near a charted rock, the charted rock has been retained in green on the Hdrawing. Chart according to the Hdrawing.
[47] Due to scale, not all *rky* and *Rk* notations on the smooth sheet are depicted on the Hdrawing. Chart *rky* and *Rk* notes according to the Hdrawing.
[48] Strikethrough ~~MHL~~, replace with "MHW". See Final Tide Note attached to this report for further information.
[49] Filed with the hydrographic records.
[50] Concur. Bottom samples have been retained in green on the Hdrawing from Chart 16566.
[51] Concur.
[52] Chart 7 fm 1 ft sounding at smooth sheet position.
[53] The sounding is not depicted on the Hdrawing. A shoaler, nearby sounding is selected instead. Chart according to the Hdrawing.
[54] Chart 7 fm 4 ft sounding at smooth sheet position.
[55] The sounding is not depicted on the Hdrawing. A shoaler, nearby sounding is selected instead. Chart according to the Hdrawing.
[56] Other nearby rocks are shown on the smooth sheet and Hdrawing. Chart 1 fm with *Rks* notation as shown on the Hdrawing.
[57] Chart 6 fm 4 ft sounding at smooth sheet position.
[58] Strikethrough ~~in the survey were discovered~~, replace with "were discovered in the survey area".
[59] Concur.

APPROVAL SHEET
H11195

Initial Approvals:

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

Bruce A. Olmstead Date: 9/12/2006

Bruce A. Olmstead
Cartographic Team
Pacific Hydrographic Branch

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

, CDR/NOAA Date: 18 SEPT 2006

Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

David Scharff
AWOIS and SURF check
DACB Hydrographic Surveys Division
2006.11.30 11:27:17 -05'00'

NOAA FORM 75-96
(10-83)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

MARINE CHART BRANCH

# RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H11195

## INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

| CHART | DATE | CARTOGRAPHER | REMARKS |
|---|---|---|---|
| 16566 | 6/29/06 | B. TAYLOR | Full ~~Part Before After~~ Marine Center Approval Signed Via APPLICATION |
| | | | Drawing No. OF SOUNDINGS & FEATURES FROM |
| | | | SMOOTH SHEET |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED