H-11193

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-11193

LOCALITY

State ALASKA

General Locality Southwest Alaska Peninsula

Sublocality Castle Cape and Nikolai Cove

2003

CHIEF OF PARTY
DEAN MOYLES

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DATE

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-11193

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 Cape and Nikolai Cove**

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

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

H11193 (Sheet AC), is bounded by the coordinate listing below, and encompasses Castle Cape and Nikolai Cove.[1]

Hydrographic data collection began on May 1, 2003 and ended on June 6, 2003.

Table 1 H11193 Survey Limits

Survey Limits[2] Task Order # 11 H11193 Sheet AC Scale 1:10,000		
Point #	Positions on NAD83	
	Degrees Latitude (N)	Degrees Longitude (W)
1	56º15’06.996” N	158º09’21.782” W
2	56º14’23.373” N	158º08’28.325” W
3	56º11’54.310” N	158º13’46.769” W
4	56º11’26.624” N	158º13’46.769” W
5	56º11’26.585” N	158º12’27.565” W
6	56º11’00.081” N	158º12’27.565” W
7	56º11’00.042” N	158º05’3.361” W
8	56º15’06.919” N	158º05’03.361” W
9	56º15’06.996” N	158º09’21.782” W[3]

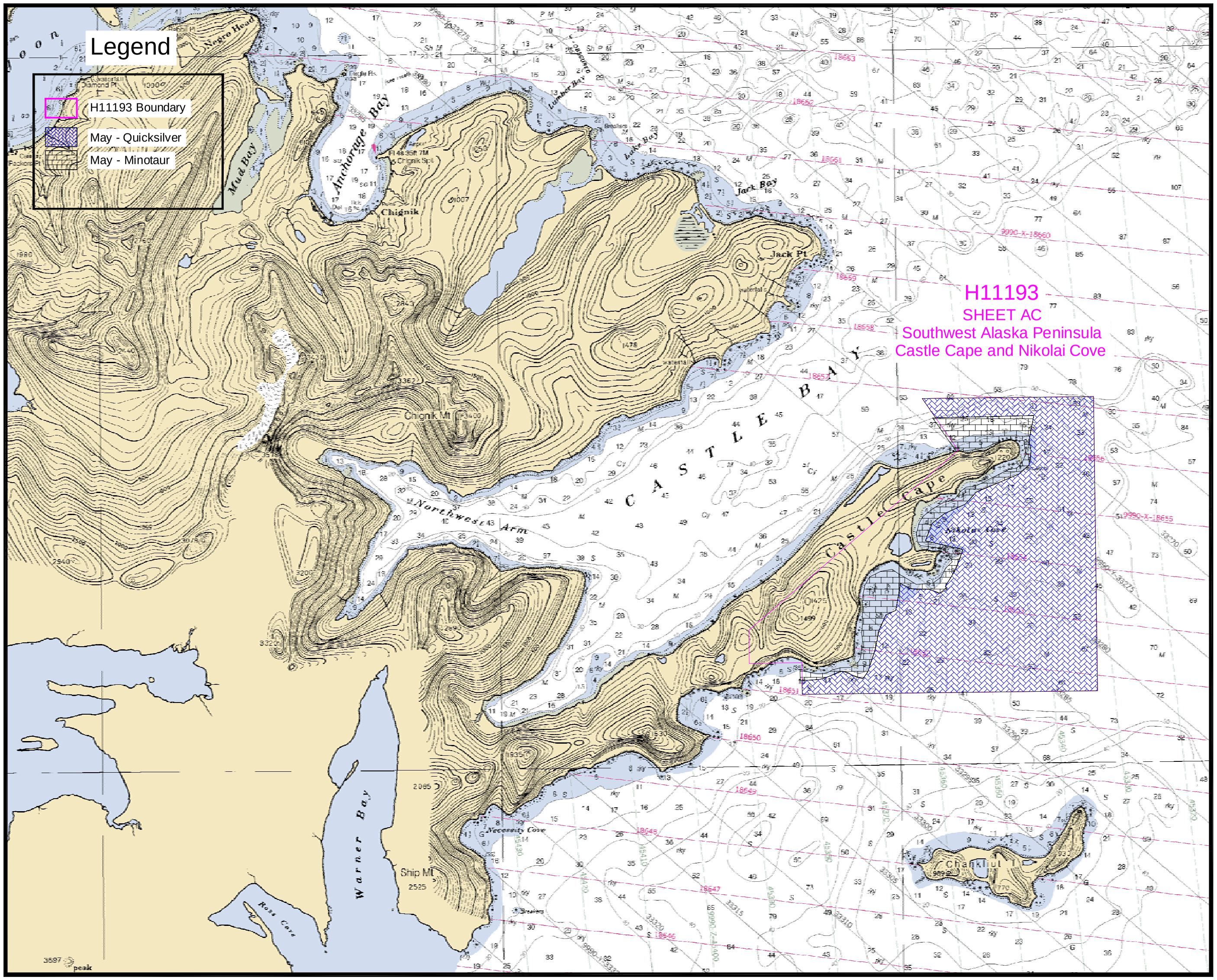


Figure 1 H11193 Survey Limits

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 H11193. 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 49.04 km (26.48 nautical miles) or 7.5 percent of the total main scheme miles. Thirty or forty percent of the total line kilometers surveyed in Sheet AC 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.

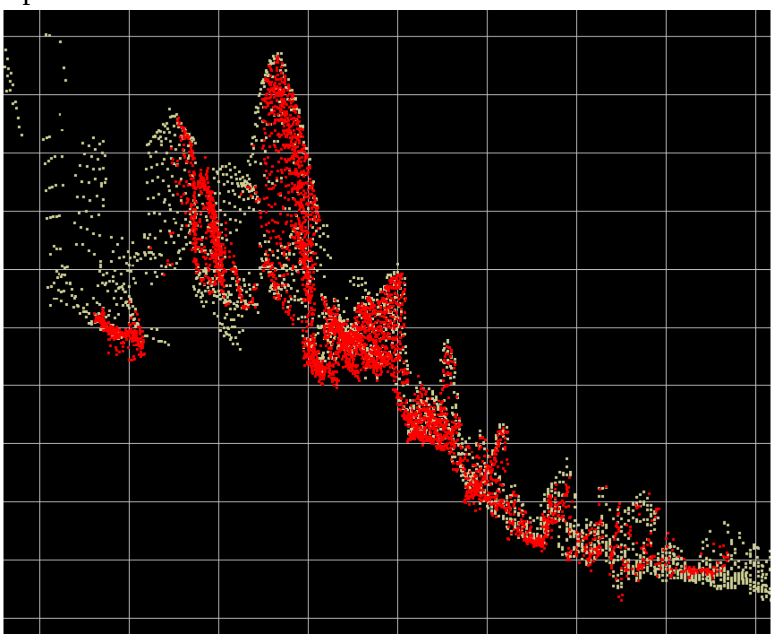


Figure 2: Profile of AC01-QC005

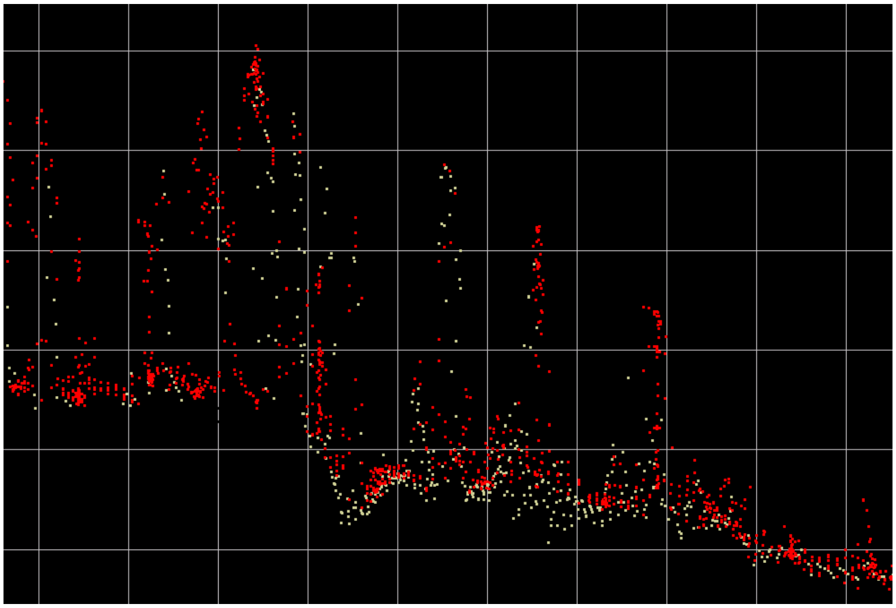


Figure 3: Profile of AC02-QC002

- 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.

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:

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

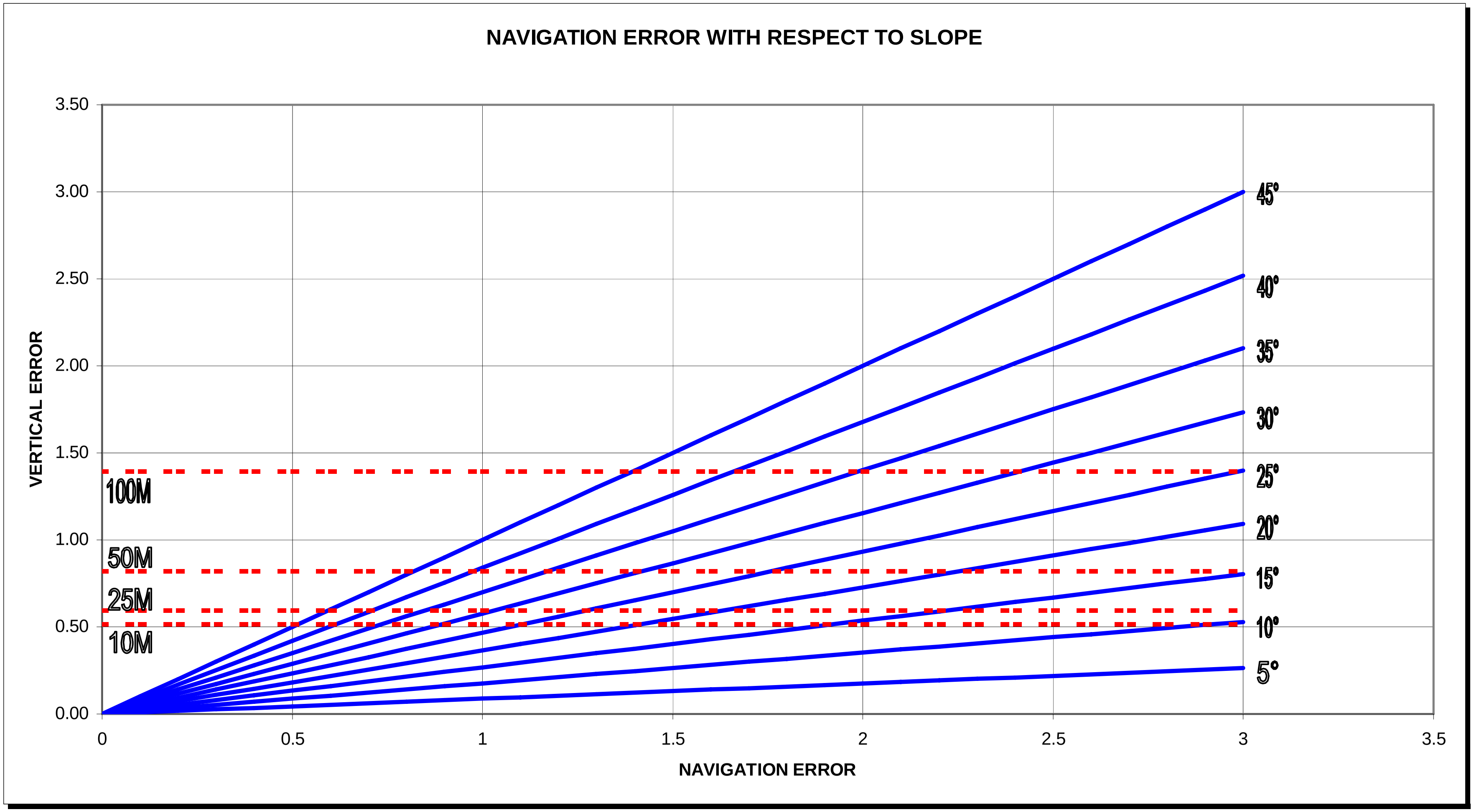


Figure 4: Navigation Error With Respect to Slope

Data Quality

In general the multibeam data quality for H11193 was excellent[10], there were no unusual conditions encountered.

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[11].

Survey Junctions

H11193 (Sheet AC) junctions with:

Registry #	Scale	Date	Junction Side
H11191	1:10,000	2003	South[12]
H11192	1:10,000	2003	Northeast[13]
H11194	1:10,000	2003	East[14]

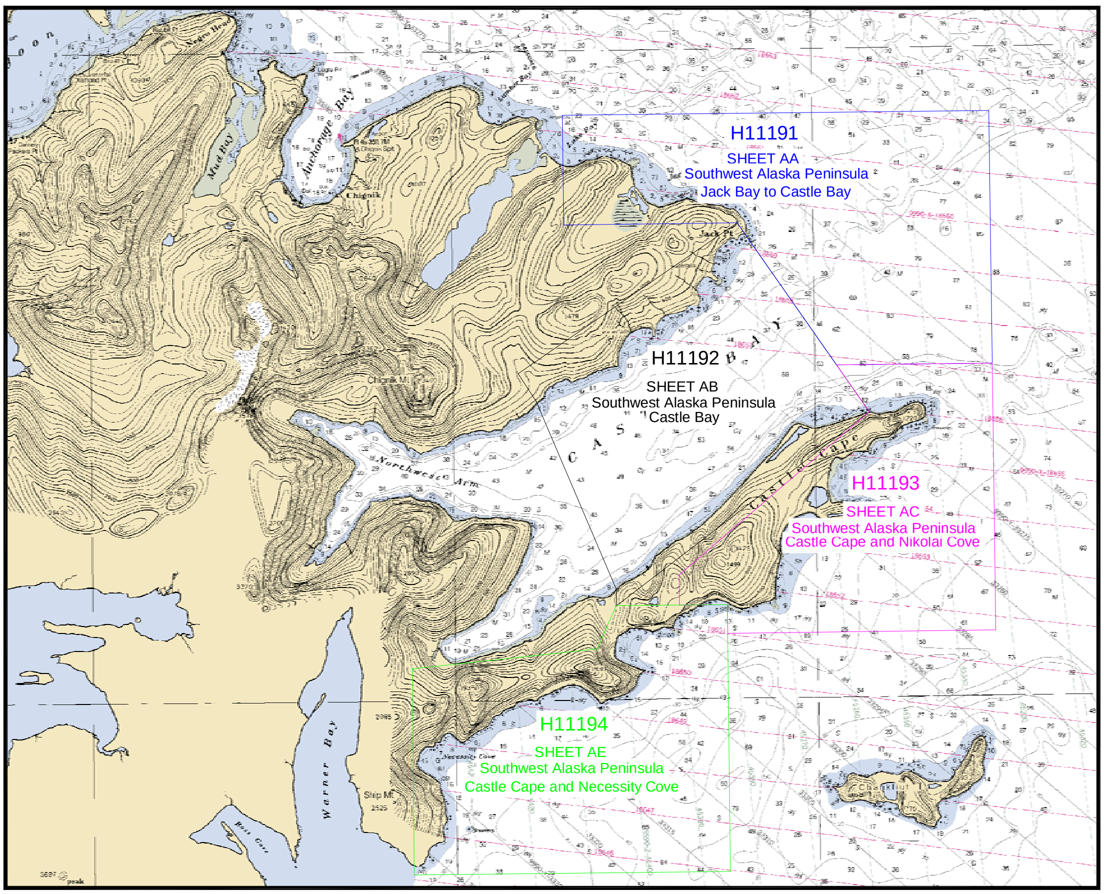


Figure 5 H11193 Survey Junctions

The surveys are in agreement along their common borders.[15] 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[16] Histogram is for the Reson 8101 data collected from May 1, 2003 to June 6, 2003 on the Quicksilver. The histogram is evenly distributed, but there is the increased number of selected soundings on the port side. This is the result of surveying near the shoreline and the simple fact that the outer beams are the shallowest. It is also apparent on these examinations the transition from phase to amplitude detection method of the sonar (around beams 36 and 71) and any errors due to sound velocity.[17] The decrease of selected soundings on the starboard 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[18] resulting in fewer selected soundings.

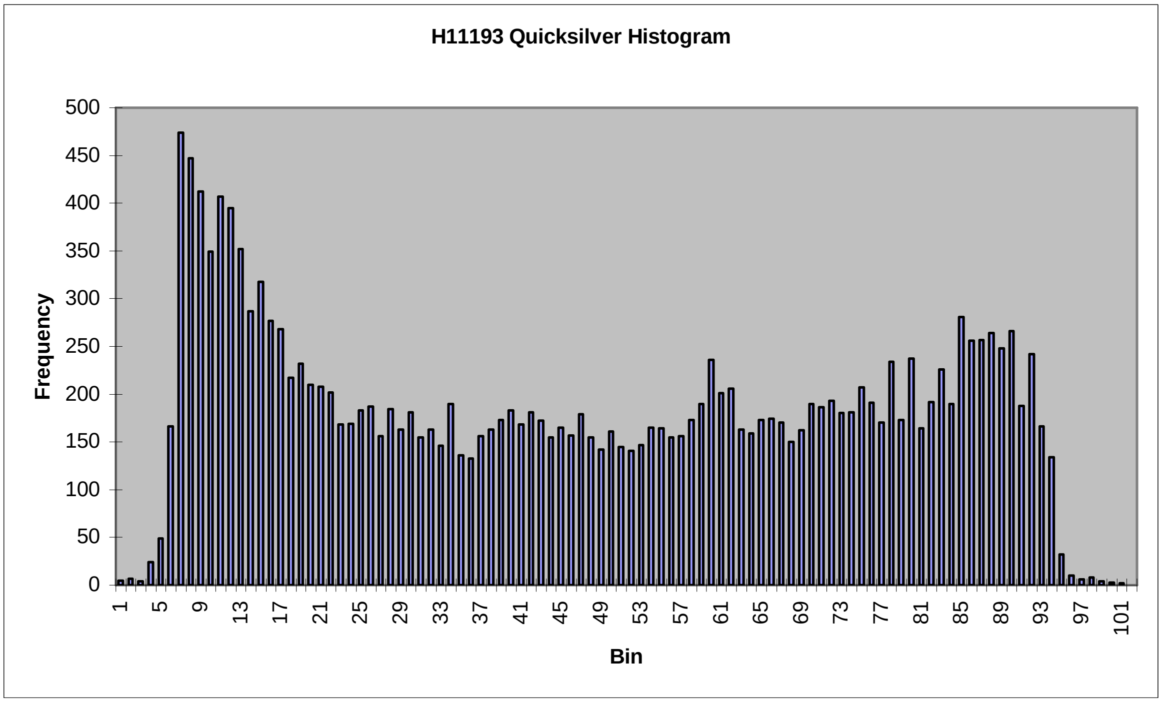


Figure 6 Histogram for 8101 (Quicksilver)

Figure 6[19] Histogram is for the Reson 8101 data, collected from May 1, 2003 to June 6, 2003 on the Minotaur. The histogram shows an increase on selected soundings from the outer beams. This is the result of surveying near the shoreline and the simple fact that the outer beams are the shallowest. Also the majority of lines were run, port beams overlapped with port beams and starboard beams overlapped with starboard beams from the adjacent lines.[20] This makes it possible to have higher density data per square meter on the outer edges, leading to a higher chance of sounding selection on the smooth sheet.

This histogram also shows one distinct feature, which is the increase in the number of selected soundings from beams 95 and 101. This does not appear to be the result of equipment failure, survey or processing procedures. Inspection of the smooth sheet reveals trends where those beams are shoaler than the rest of the profiles simply because it is[21] up slope from all other soundings. The crossline comparisons revealed that these beams[22] were within IHO specifications; any differences were only a few centimeters.[23]

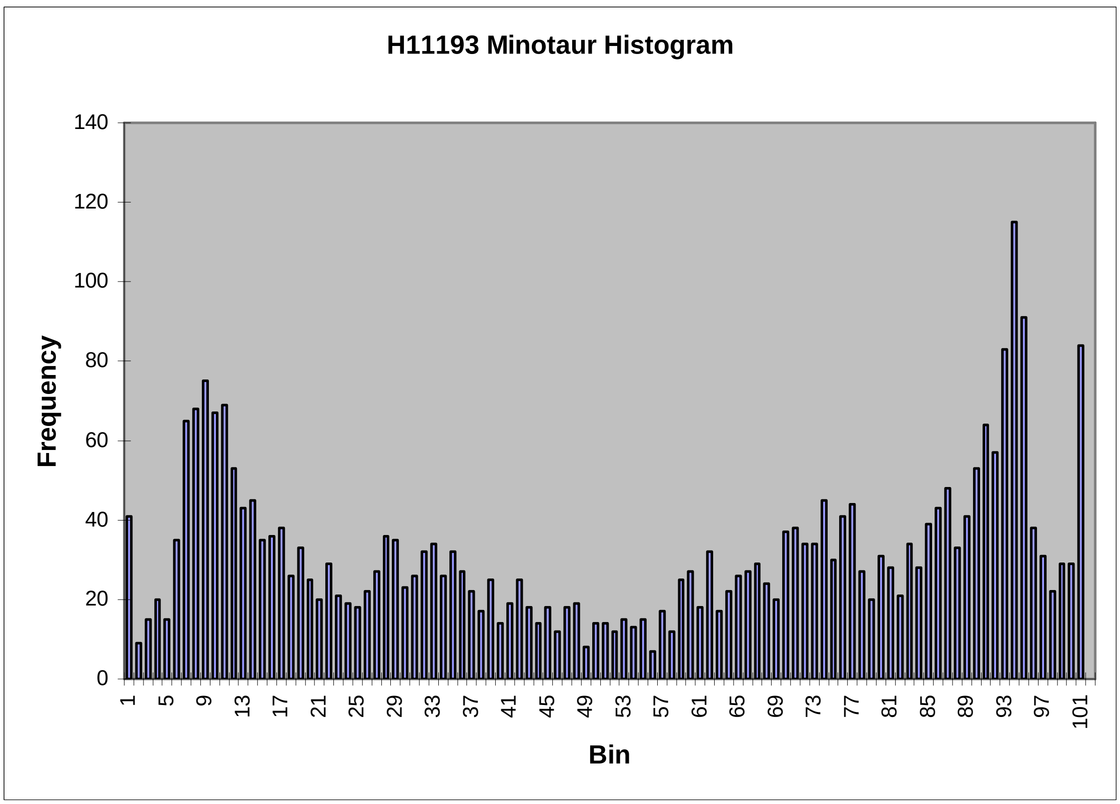


Figure 7 Histogram for 8101 (Minotaur)

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 usually consisted of the vessels running two lines in the opposite direction[24] 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[25] 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[26] for a detailed description of the horizontal and vertical control used on this Survey. A summary of the projects[27] 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 [28](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 [29]

H11193 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. Areas of differences to note are[30]:

- Hydrographic survey H11193 revealed a depth of 24 fathoms in the vicinity of a 31 fathom sounding on chart 16566 located at 56º14'59.470" N, 158º06'33.745" W (555186.688 E, 6234244.727 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 24 fathoms in the vicinity of a 33 fathom sounding on chart 16566 located at 56º14'37.067" N, 158º05'24.118" W (556394.232 E, 6233567.785 N). This area was surveyed with 100% multibeam coverage.[31]
- Hydrographic survey H11193 revealed a depth of 23 fathoms in the vicinity of a 40 fathom sounding on chart 16566 located at 56º14'02.241" N, 158º05'17.363" W (556524.748 E, 6232492.674 N). This area was surveyed with 100% multibeam coverage.[32]

- Hydrographic survey H11193 revealed a depth of 26 fathoms in the vicinity of a 31 fathom sounding on chart 16566 located at 56º13'32.791" N, 158º05'54.679" W (555894.119 E, 6231573.729 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 26 fathoms in the vicinity of a 34 fathom sounding on chart 16566 located at 56º13'21.496" N, 158º05'07 28.811" W[33] (554277.384 E, 6231203.650 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 34 fathoms in the vicinity of a 42 fathom sounding on chart 16566 located at 56º13'10.667" N, 158º05'17.903" W (556536.554 E, 6230898.101 N). This area was surveyed with 100% multibeam coverage.[34]
- Hydrographic survey H11193 revealed a depth of 19.9 fathoms in the vicinity of a 23 fathom sounding on chart 16566 located at 56º12'46.866" N, 158º08'14.738" W (553499.732 E, 6230123.069 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 28 fathoms in the vicinity of a 32 fathom sounding on chart 16566 located at 56º11'33.264" N, 158º07'49.496" W (553963.304 E, 6227853.100 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 37 fathoms in the vicinity of a 50 fathom sounding on chart 16566 located at 56º11'21.175" N, 158º06'43.415" W (555107.191 E, 6227493.857 N). This area was surveyed with 100% multibeam coverage.
- Hydrographic survey H11193 revealed a depth of 37 fathoms in the vicinity of a 50 fathom sounding on chart 16566 located at 56º11'13.726" N, 158º10'33.046" W (551151.349 E, 6227214.430 N). This area was surveyed with 100% multibeam coverage.[35]

Soundings that differ from hydrographic survey H11193 are highlighted in red on the chart comparison sheet included in Separate 6[36]. Other soundings that differed resulted in a Danger to Navigation and are listed in Appendix A Danger to Navigations[37].

Since Charts 16011 and 16013 have little or no detail pertaining to the contours, the hydrographer compared the contours from H11193 to Chart 16566.

The near shore contours agree with the existing chart 16566, but as illustrated in Figure 8 below, the contours from H11193 bring forth much more detail of the bottom topology.[38]

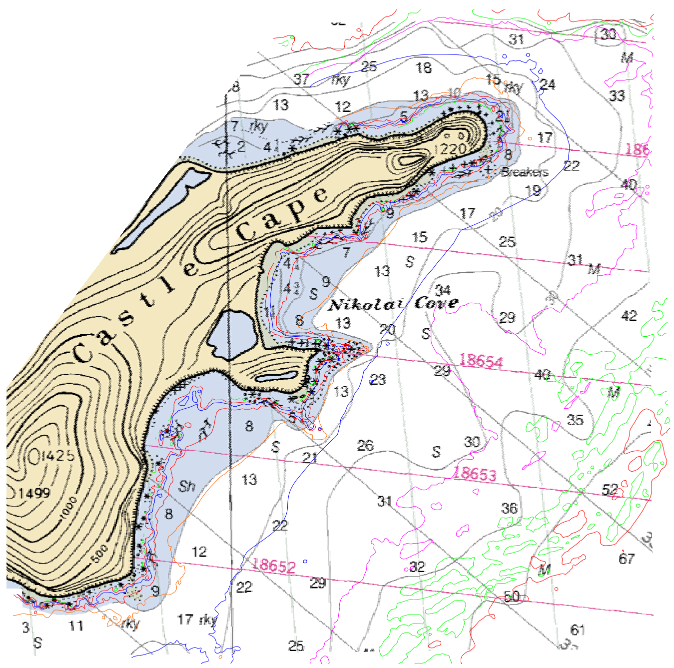


Figure 8 Comparison of Contours

Automated Wreck and Observation Information System

There were no AWOIS items assigned to OPR-P182-KR-03.[39]

Charted Features

There were no charted features labeled PA, ED, PD, or Rep within the limits of H11193.[40]

Dangers to Navigation

Eleven dangers to navigation were located during the hydrographic survey of H11193 and were submitted on August 12, 2003. Refer to Appendix A[41] 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 H11193 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[42] 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.[43]

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[44] multibeam coverage plots, T-sheets, digital manuscript data, and affected charts for final MHW verification.[45] 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.[46]

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. The largest change that was noted was that many point features in the source data were actually small islets.[47] 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. Charted islet at 56 11 22.09 N, 158 12 25.14 W (N6227450.34, E549215.80) was positioned by DP#136_68. This feature is depicted as a rock on AK0209. However, this survey found the DM point feature to be an islet (27 ft ht MHW).[48]
2. DM point feature at 56 11 44.68 N, 158 11 6.82 W (N6228164.47, E550557.78) was positioned by DP#150_05 to be an islet (3 ft ht MHW).[49]

Features that are itemized and discussed are as follows:

1. DP'd rocks found more then[50] 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

<u>Source Data – Disprovals and Exceptions (from TP-00913 and AK209)</u>
No source data disprovals or exceptions were found in this area, except as stated under changes to MHW above.

<u>Charted Shoreline - Disprovals and Exceptions (from CH 16566)</u>

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 appear as[51] 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.[52]

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.[53]

1. CH16566 shows two islets at 56 12 40.05 N, 158 9 11.99 W (N6229900, E552516). However, during limited shoreline verification only one islet was located. It was positioned by DP# JD150_02.[54]

Disproved charted rocks that were also T-sheet items are listed in the previous section.[55]

Recommendations for Additional Item Investigations

1. Multibeam gap at 56 12 55.57 N, 158 8 46.77 W (N6230385.31, E552944.56), inshore of the 4-meter curve, did not receive shoreline investigation and shoaling along its edges indicates a feature. It is presented as a ledge on the smooth sheet.[56]
2. Multibeam gap at 56 12 37.68 N, 158 10 18.46 W (N6229813.06, E551371.69), inshore of the 4-meter curve, was investigated by DP# JD150_03. No feature was found, but the MB gap indicates a shoal. A ledge is presented on the smooth sheet at this position.[57]
3. Multibeam gap at 56 11 19.83 N, 158 12 15.13 W (N6227382.35, E549389.2), inshore of the 4-meter curve, did not receive shoreline investigation and shoaling along its edges indicates a feature. It is presented as a foul limit line on the smooth sheet.[58]

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.[59]

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.

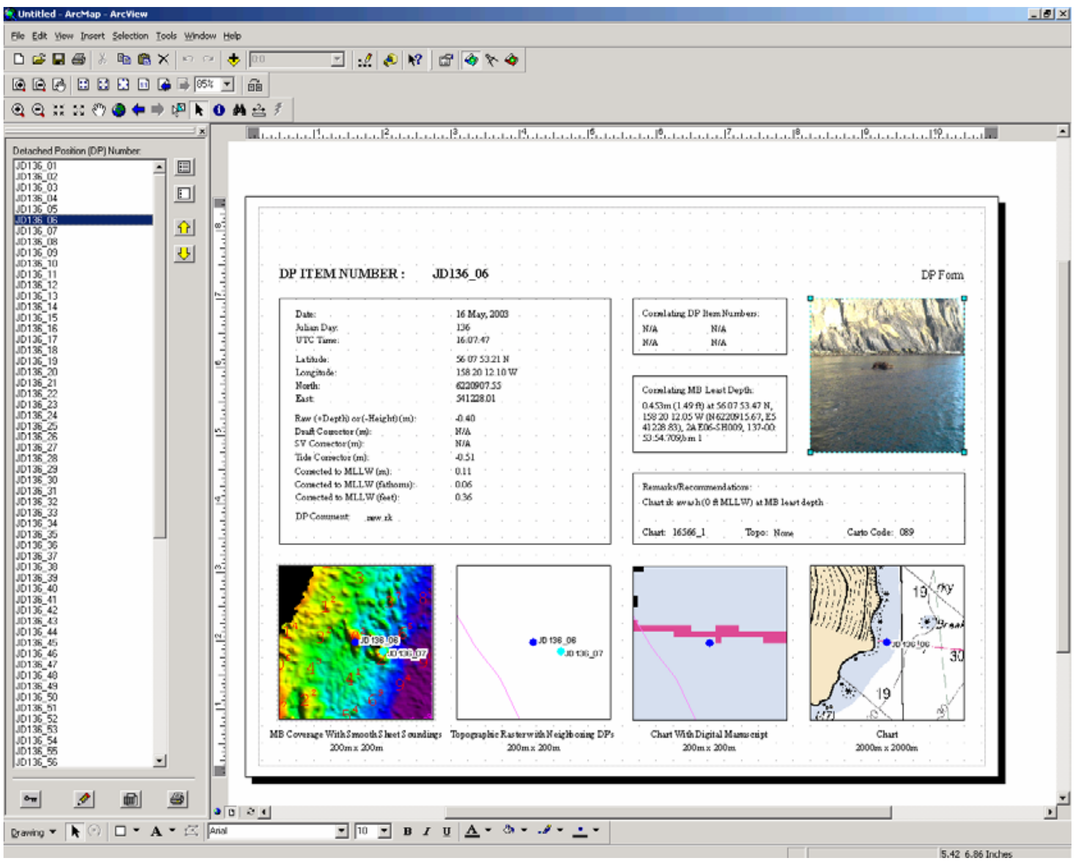


Figure 9 DP Correlator Sheet

Bottom Samples

Bottom Samples were not required under this contract.[60]

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.[61]

E – Approval Sheet

Approval Sheet

For

H11193

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

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

Appendix A - Danger to Navigation

Eleven dangers to navigation were located during the hydrographic survey of H11193.

Danger to Navigation Report

Hydrographic Survey Registry Number: **H11193**

Survey Title: State: Alaska Locality: Southwest Alaska Peninsula Sub-locality: Castle Cape to Nikolai Cove

Project Number: OPR-P182-KR-03

Survey Dates: 5/6/03 to Present

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

CHARTS AFFECTED:

Chart	Scale	Edition	Date
16011	1:1,023,188	35th	12/02/00
16013	1:969,761	28th	4/14/01
16566	1:77,477	10th	2/20/99

DANGERS:

Feature	Depth(ft or fms)	Latitude	Longitude
Sounding	5 ½ fm	56° 12' 27.6"N	158° 08' 56.8"W[62]

COMMENTS:

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206) 526-6436

Danger to Navigation Report

Hydrographic Survey Registry Number: **H11193**

Survey Title: State: Alaska Locality: Southwest Alaska Peninsula Sub-locality: Castle Cape and Nikolai Cove

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	5 1/4 fms	56° 14' 37.8"	158° 07' 33.0"[63]
Sounding	7 fms	56° 14' 20.5"	158° 06' 26.0"[64]
Sounding	6 1/2 fms	56° 14' 43.4"	158° 07' 07.7"[65]
Sounding	9 3/4 fms	56° 14' 42.7"	158° 06' 42.7"[66]
Rock	3/4 fms	56° 13' 53.3"	158° 08' 10.0"[67]
Rock	1 1/4 fms	56° 12' 27.9"	158° 09' 03.1"[68]
Sounding	7 3/4 fms	56° 11' 32.5"	158° 10' 35.3"[69]
Sounding	7 1/4 fms	56° 11' 24.3"	158° 10' 44.8"[70]
Sounding	8 1/2 fms	56° 11' 12.4"	158° 11' 25.6"[71]
Sounding	9 3/4 fms	56° 10' 58.6"	158° 10' 08.8"[72]

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.[73]

Appendix C – Progress Sheet

PROGRESS SKETCH

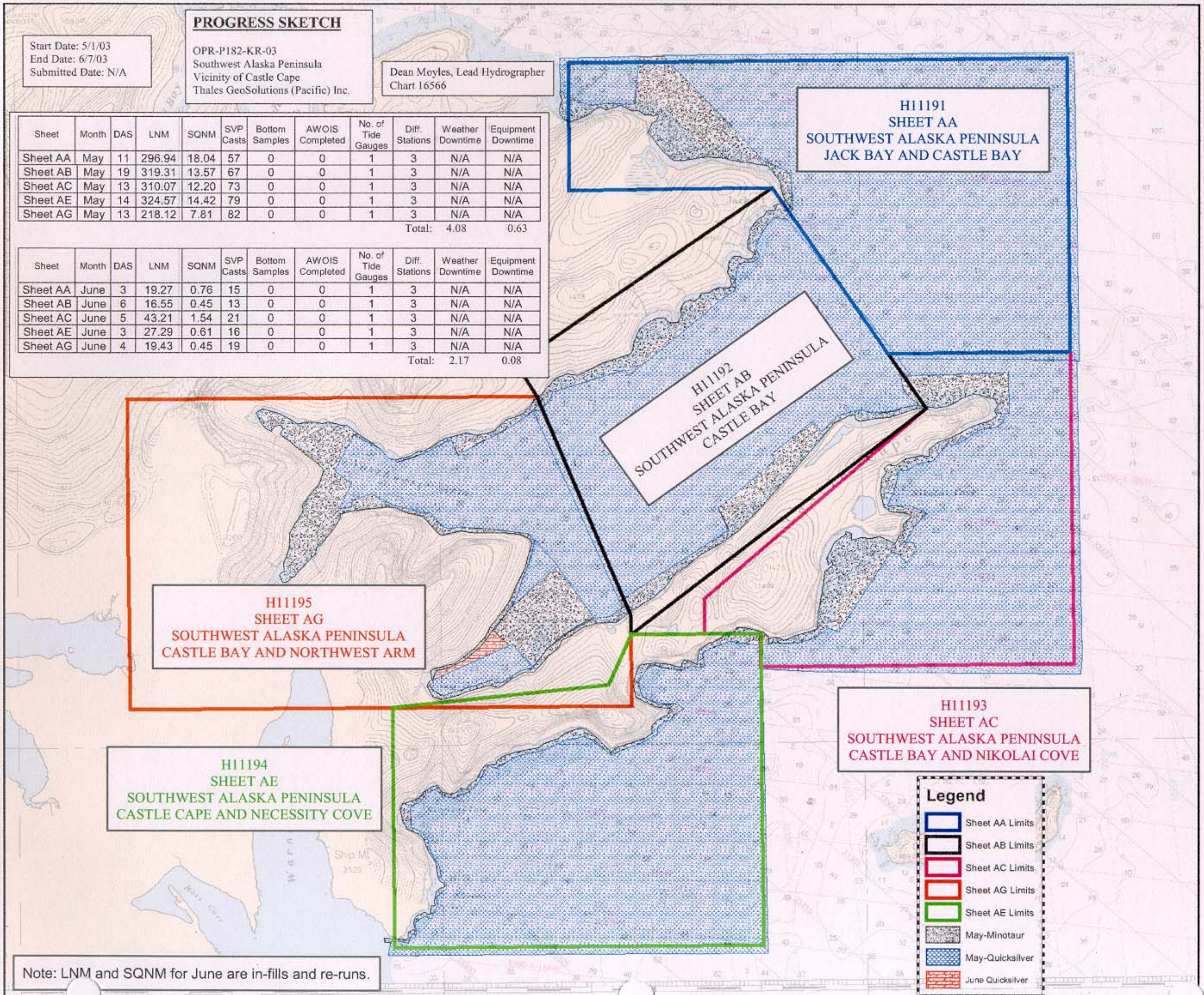
Start Date: 5/1/03
End Date: 6/7/03
Submitted Date: N/A

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



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: H11193

Sheet AC
Castle Cape and Nikolai Cove
SW Alaska Peninsula

NOAA Project No: NOAA Contract No:	OPR-P182-KR-2003 Alaska 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: Castle Bay:	Lat (NAD 83) 56° 13' 54"	Long (NAD 83) 158° 20' 48"	Time Meridian: 0° (UTC)
Time Period and Datum Reference	Name: Castle Bay:	Established: 4/25/2003	Removed: 6/7/2003	MLLW MHW units 0.000 2.441 meters *NOS Published Datum*
Tide observer	John Oswald & Associates LLC (JOA) 12001 Audubon Drive Anchorage, Alaska 99516 (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 . 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: Castle Bay: 8907 A 2001, 8907 B 2001, 8907 C 2001, 8907 D 2001, 8907 E 2001 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.[74]

Revisions Compiled During Office Processing and Certification

[1] Concur.
[2] Concur with clarification. The approximate limits of hydrography are:
- Lat 56/15/16.9N and Lon 158/9/33.1W
- Lat 56/15/16.9N and Lon 158/4/50.0W
- Lat 56/10/51.8N and Lon 158/12/42.9W
- Lat 56/10/51.8N and Lon 158/4/50.0W

[3] Concur with clarification. Point 9 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] Concur. H11193 is adequate to supersede all prior surveys and miscellaneous source data except as noted in this report and the Hdrawing.
[11] Insert "in these areas".
[12] Strikethrough ~~South~~, replace with "North".
[13] Strikethrough ~~Northeast~~, replace with "Northwest".
[14] Strikethrough ~~East~~, replace with "West".
[15] Concur. In PHB processing, H11193 was also compared at its southern junction with H11459. Common areas showed good correlation. All data sets were considered when compiling contours and soundings to the Hdrawing.
[16] Strikethrough ~~5~~, replace with "6".
[17] Strikethrough ~~It is also apparent on these examinations the transition from phase to amplitude detection method of the sonar (around beams 36 and 71) and any errors due to sound velocity~~, replace with "the transition from phase to amplitude detection method of the sonar (around beams 36 and 71) and any errors due to sound velocity are apparent".
[18] Strikethrough ~~bases~~, replace with "basis".
[19] Strikethrough ~~6~~, replace with "7".
[20] Strikethrough ~~the majority of lines were run~~, replace with "in the majority of lines run".
[21] Strikethrough ~~it is~~, replace with "they are".
[22] Strikethrough ~~beams~~, replace with "soundings".
[23] Survey data is acceptable for charting.
[24] Strikethrough ~~the opposite direction~~, replace with "opposite directions".
[25] Strikethrough ~~where~~, replace with "were".
[26] Filed with the project reports.
[27] Strikethrough ~~projects~~, replace with "project's".
[28] Insert "Zone 4".
[29] In PHB processing, H11193 was also compared with Chart 16566, 11th Edition, continuous maintenance raster.
[30] The evaluator concurs with the hydrographer's chart comparisons listed below except as noted. Chart all areas according to the smooth sheet.

[31] Concur with clarification. The 33 fm sounding does not appear on Chart 16566, 11th Edition, continuous maintenance raster.
[32] Concur with clarification. The 40 fm sounding does not appear on Chart 16566, 11th Edition, continuous maintenance raster.
[33] Strikethrough ~~158º05'07 28.811" W~~, replace with "158º07' 28.811" W".
[34] Concur with clarification. The 42 fm sounding does not appear on Chart 16566, 11th Edition, continuous maintenance raster.
[35] Do not concur. The charted sounding at this position is 17 fms. The highlighted sounding on the chart comparison graphic (Separate 6, filed with the project reports) is the charted 17 fm sounding. The shoalest sounding from survey H11193 in the vicinity is 13.3 fms. Chart according to the smooth sheet.
[36] Filed with the project reports.
[37] Strikethrough ~~Danger to Navigations~~, replace with "Dangers to Navigation". Attached to this report.
[38] Concur with clarification. The nearshore contours are often in agreement with charted contours. Note that some errors occurred in the depiction of contours on the smooth sheet. Errors have been corrected on the Hdrawing. Chart contours as generalized on the Hdrawing.
[39] Concur.
[40] Concur.
[41] Attached to this report.
[42] Strikethrough ~~was~~, replace with "were".
[43] Filed with the project reports.
[44] Strikethrough ~~H11191~~, replace with "H11193".
[45] Chart MHWL according to the smooth sheet.
[46] Filed with the project reports.
[47] Concur with clarification. New islets are shown on the smooth sheet in red and on the Hdrawing in red on level one.
[48] Concur. Chart according to the smooth sheet and Hdrawing.
[49] Concur. Chart according to the smooth sheet and Hdrawing.
[50] Strikethrough ~~then~~, replace with "than".
[51] Strikethrough ~~appear as~~, replace with "their former positions are included in".
[52] 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.
[53] Due to scale, not all *rky* and *Rk* notations on the smooth sheet were depicted on the Hdrawing. Chart *rky* and *Rk* notes according to the Hdrawing.
[54] Concur with clarification. Only one islet is shown in the vicinity of the smooth sheet islet on the continuous maintenance raster for Chart 16566, 11th Edition. Chart islet at smooth sheet position.
[55] There were no disproved charted rocks that were individually listed.
[56] Do not concur. There is no ledge depicted at this position on the smooth sheet. Chart foul area as depicted on the smooth sheet and Hdrawing.
[57] Do not concur. There is no ledge depicted at this position on the smooth sheet. Chart foul area as depicted on the smooth sheet and Hdrawing.
[58] Concur. Chart according to the smooth sheet and Hdrawing.

[59] Strikethrough ~~MHL~~, replace with “MHW”. See Final Tide Note attached to this report for further information.
[60] Concur. Bottom samples have been retained in green on the Hdrawing from Chart 16566.
[61] Concur.
[62] The DtoN is not shown on the Hdrawing due to a nearby shoaler sounding. Chart according to the Hdrawing.
[63] Chart 5 fm 2 ft sounding at smooth sheet position.
[64] The 7 fm sounding is a rock on the smooth sheet. Chart 7 fm with *Rks* notation as portrayed on the Hdrawing.
[65] Chart 6 fm 3 ft sounding at smooth sheet position.
[66] Chart 9 fm 5 ft sounding at smooth sheet position.
[67] The smooth sheet shows a 0 fm rock awash at this location. Chart rock awash according to the smooth sheet.
[68] Chart 1 fm 2 ft with *Rks* notation as portrayed on the Hdrawing.
[69] The sounding is charted as 7 ½ fm. It is not shown on the Hdrawing due to a nearby, shoaler sounding. Chart according to the Hdrawing.
[70] The sounding is charted as 7 ¼ fm. It is not shown on the Hdrawing due to a nearby, shoaler sounding. Chart according to the Hdrawing.
[71] Chart 8 fm 4 ft sounding at smooth sheet position.
[72] The sounding is shown as a rock on the smooth sheet. Chart 9 fm 5 ft *Rk* at smooth sheet position.
[73] Strikethrough ~~in the survey were discovered~~, replace with “were discovered in the survey area”.
[74] Concur.

APPROVAL SHEET
H11193

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: 8/9/2006
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: 22 AUGUST 2006
Donald W. Haines
CDR, NOAA
Chief, Pacific Hydrographic Branch

Digitally signed by Mark Lathrop
Reason: AWOIS & Surf Check
Date: 2006.11.28 12:00:56 -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. H11193

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	6/20/06	B. TAYLOR	Full Part ~~Before After Marine Center Approval Signed~~ Via APPLICATION
			~~Drawing No.~~ OF SOUNDINGS AND 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
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SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED