H11124

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. H11124

LOCALITY

State Alaska

General Locality Sitka

Sublocality Deep Inlet

2004

CHIEF OF PARTY
David A. Sinson, NOAA

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DATE

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H11124

HYDROGRAPHIC TITLE SHEET

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: Sitka

Sublocality: Deep Inlet

Scale: 1:10,000

Date of Survey: Oct 26 - Oct 29, 2004

Instructions Date: 9/3/2004

Project No.: OPR-O112-TC-04

Vessel: R/V DAVIDSON, Launches D2 and R2, and skiff (DP)

Chief of Party: P.S. David A. Sinson, NOAA

Surveyed by: SAIC Personnel

Soundings taken by echo sounder: RESON 8111, 8125 and 8101 MB Echosounders

Graphic record s: SAIC Personnel

Graphic record checked by: SAIC Personnel

Evaluation by: M. Herzog

Verification by: K. Toepfer

Soundings in: Fathoms at MLLW

REMARKS: Time in UTC. UTM Projection Zone 8

Revisions and annotations appearing as endnotes were generated during office processing. As a result, page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted

All separates are filed with the project or hydrographic data.

Descriptive Report to Accompany Hydrographic Survey H11124

Project OPR-O112-TC-04
Deep Inlet
Sitka, Alaska
Scale 1:10,000
October 2004
NOAA Time Charter R/V DAVIDSON
Lead Hydrographer: PS David A. Sinson, NOAA
Survey Manager: Bonnie Johnston, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-O112-TC-04, dated September 22, 2004, and the Draft Standing Project Instructions dated March 23, 2004[1]. The survey area includes Deep Inlet within Sitka Sound, Alaska.

Northern Limit	Southern Limit	Western Limit	Eastern Limit
56° 59' 58.15" N	56° 55' 55.25" N	135° 19' 54.44" W	135° 12' 29.17" W

Data acquisition was conducted from October 26 to October 29, 2004 (Julian day numbers 300 to 303).

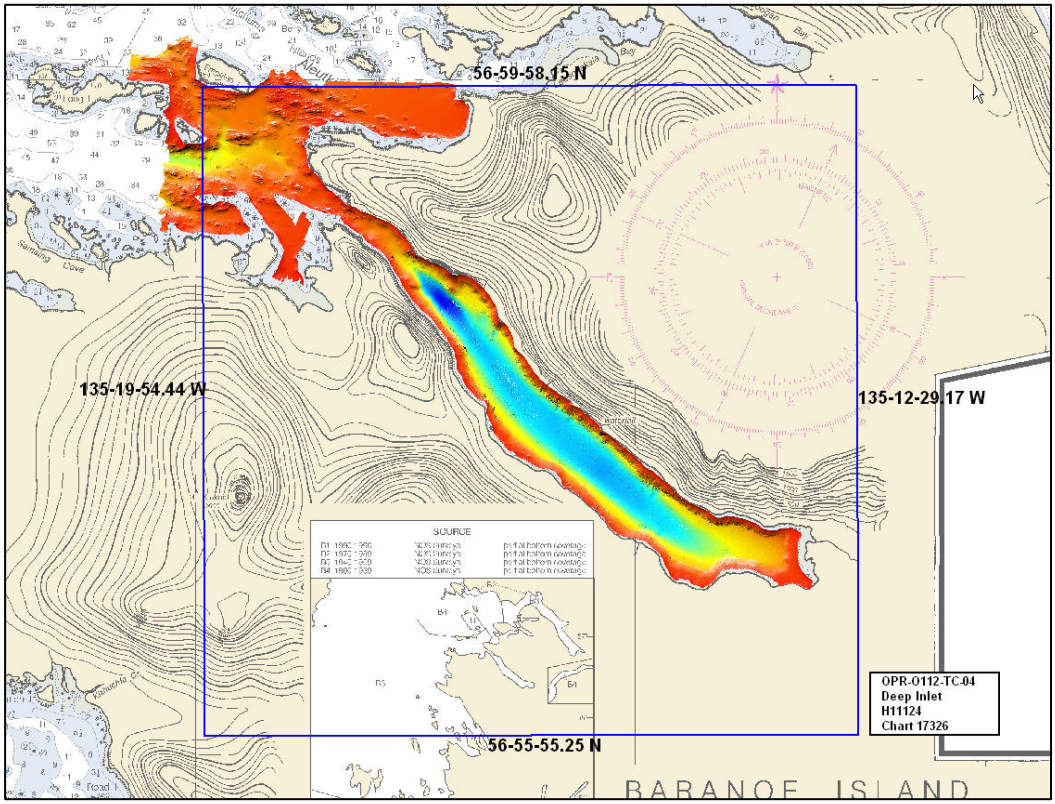


Figure 1. *OPR-O112_TC-04 Survey H11124 limits and coverage.*

B. DATA ACQUISTION AND PROCESSING

Refer to ***OPR-O112-TC-04 Data Acquisition and Processing Report (DAPR)***[2] for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods, submitted under a separate cover. Additional information to supplement sounding and survey data, and any deviations from the DAPR are included in this descriptive report.

B1. Equipment and Vessels

Data were acquired by the R/V DAVIDSON, survey launches R2 and D2 and a skiff (DP). The ship was used to acquire mid-water multibeam soundings (MWMB) in depths generally greater than 40 meters, sound velocity profiles (SVP) and bottom samples. Launch D2 acquired shallow-water multibeam soundings (SWMB) in depths generally less than 120 meters, SVP and bottom samples. Launch R2 acquired high-resolution SWMB soundings in depths generally less than 60 meters and SVPs. The skiff acquired vertical-beam echosounder soundings (VBES) for shoreline buffers and high-accuracy geographic positions for shoreline feature verification. Vessel configurations, equipment operation and data acquisition and processing were consistent with specifications described in the DAPR.

B2. Quality Control

B2.1 System Certification and Calibration

Refer to ***OPR-P139-TC-04 Data Acquisition and Processing Report (DAPR)*** for a description of SAIC's quality assurance (QA) and quality control (QC) plan. A System Acceptance Test Report, included as an appendix to the DAPR, describes system integration and initial calibration results for equipment and sensors utilized for this survey.

A system calibration survey was performed in Seward Harbor on September 27, 2004 (JD 271) to verify sensor performance as well as tide, sound velocity, alignment and offset corrections. A calibration report is included as an appendix to the DAPR.

Prior to performing the QC analysis of the submitted survey data, a BASE Surface, an uncertainty-weighted grid of the soundings, was generated in Caris HIPS 5.4. The IHO threshold for acceptable uncertainty was set to Order 1. The optimal grid resolution to represent the variability in the data, was selected based on the depth range of the survey and the resolution of the multibeam acquisition system, in this case the Reson 8101 and 8125, at those depths. For Survey H11124, a BASE surface with a resolution of 2 meters was used to QC and clean the data. The 2-meter gridded surface was found to sufficiently capture the variation and characteristics of bottom features within the survey area. BASE surfaces of 1, 2, and 5 meter resolution were submitted for branch review[3].

B2.2 Crosslines

Multibeam echosounder crosslines totaled 1.55 nautical miles, comprising 1.65% of SWMB hydrography. The narrow shape of the basin and steep basin walls precluded normal acquisition of crossline data for system evaluation[4]. Crossline soundings were evaluated with respect to main scheme soundings in Caris HIPS 5.4 Subset Area Editor and BASE surface models. In general, there was excellent agreement of depths between crossline and mainscheme soundings. Offsets of less than 0.5 meters were observed in line comparisons using Subset Editor. Multiple coverage line-to-line, vessel-to-vessel and day-to-day sounding comparisons were conducted using standard deviation and illuminated, vertically exaggerated depth surfaces. In general, there was very good agreement of depths where multiple coverage was obtained. Section B.2.4 describes data quality artifacts observed in multiple coverage evaluations.

B2.3 Junctions

No contemporary surveys junction with H11124.[5]

B2.4 Data Quality Factors

B2.4.1 Sound Velocity Profiles

ISS2000 applied sound velocity correction in real-time during echosounder acquisition. Sound velocity profiles were collected often to characterize the variable and complex water column conditions in the survey area. Surface sound velocity was monitored continuously on R2 with the Reson 8125 HRSWMB and on D2 with the Reson 8101 HRSWMB to ensure correct beam formation. Surface sound velocity was used by the 8125 and 8101 systems for correct beam formation on the flat-faced transducers for directional accuracy. Changes in surface sound velocity were also evaluated as an indicator of changes in the water column sound velocity.

A banding pattern was observed within Deep Inlet that ran parallel to survey lines and was best depicted by the standard deviation layer of the BASE surface (Figure 2). Consistent offsets ranging between 0.3 and 2 meters were observed in subset mode where the outer beams of the survey lines overlapped. The outer beams take on a slight convex quality characteristic of SVP miscalculation (Figure 3). However, the offset could also be a result of systematic limitations of the outer beams when surveying down slope on steep terrain. In general, depths agreed within 1 meter between overlapping beams of survey lines.

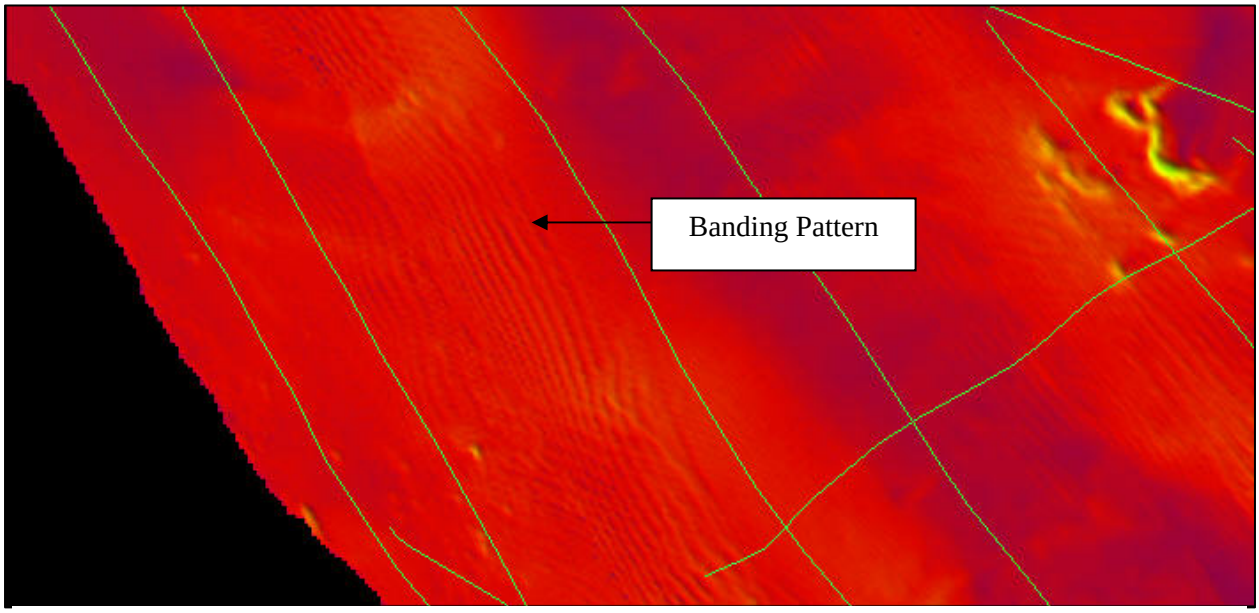


Figure 2. *Evidence of line offset in the standard deviation layer of the Caris HIPS 5.4 BASE Surface in survey H11124, potentially caused by errors in SVP correction.*

***Figure 3**. Line offset in outer beams of survey H11124 shown in Caris HIPS 5.4 Subset Editor.*

B2.4.2 Water level correction

ISS2000 applied predicted water-level correctors with CO-OPS supplied zoning in real-time during echosounder acquisition. Observed tides from the primary tide gauge were applied to soundings prior to NOAA quality review in Caris HIPS/SIPS 5.4. Soundings from crosslines and overlapping lines were examined using 3-D sounding subsets and base[6] surfaces to identify temporal variation of water level modeling. In general, there was no indication of significant water level correction errors visible in line-to-line comparisons or the final BASE surfaces.

B2.4.3 Residual Sounding Fliers and Noise

BASE surfaces were evaluated to focus data editing on areas of high standard deviation of depth. Full-density sounding subsets were reviewed where high standard deviation was indicated. Residual gross flyers and noise were identified by NOAA hydrographers in areas of unusually high standard deviation and flagged as rejected. The total range of standard deviation was 0.00 – 8.17 meters, having been reduced to a value that corresponded to general bathymetric relief for the survey area. Soundings from multiple lines were evaluated when possible to distinguish noise from bathymetric features.

B2.4.4 Systematic Errors

CARIS BASE surfaces were evaluated by NOAA hydrographers to identify systematic errors in data correctors including motion, attitude, tide and sound velocity. Sunlight illuminated surface digital terrain models (DTM) were reviewed to find errors in heave, pitch and roll correction. Standard deviation surface models were reviewed to find areas where disagreement occurred between multiple lines – an indication of inaccurate tide or sound velocity correction.

Unnatural striping perpendicular to line heading was observed on surface models in shoaler regions of the survey area northeast of the entrance to Deep Inlet. The striping appears to be an artifact from errors in heave correction, potentially caused by rough sea conditions. Swells on the dates of acquisition ranged between 1 – 4 feet. Differences between the peak and trough of the stripes were below 1 meter (Figure 4).

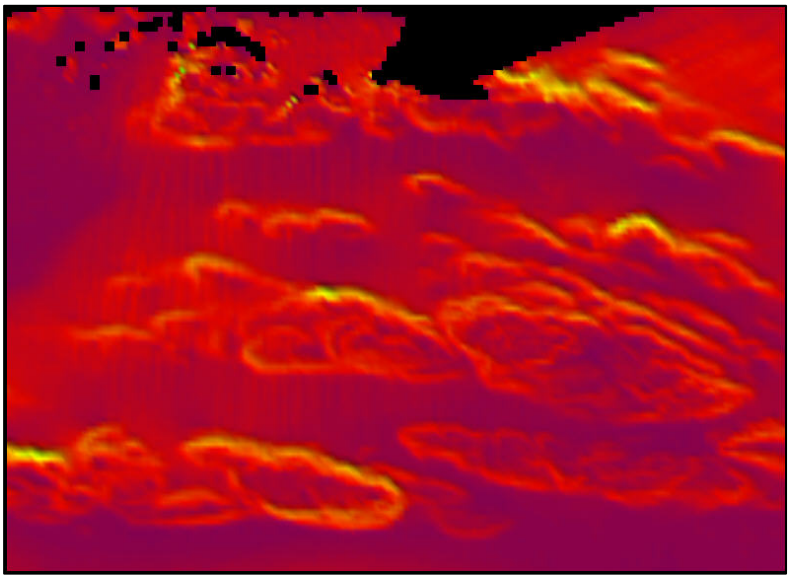


Figure 4. *Evidence of heave artifacts in the standard deviation layer of the Caris BASE surface.*

An offset of 1.5 – 2 meters was observed between lines d2mba04[300_d44], d2mba04[302_d38], and d2mba04[302_d40]. In general, depth agreement between lines [300_d44] and [302_d40] was good, but neither lines show agreement with line [302_38]. The offset was most prevalent at the tail end of line [302_38] along its outer beam, potentially due to a systematic error. Since adequate coverage was available from the other two lines, a portion of the outer beams of line d2mba04302_d38 was rejected starting at beam profile 8680 and continuing to the line end. Before and after beam rejection images of the depth BASE surface model for the area in question are displayed below (Figures 5).

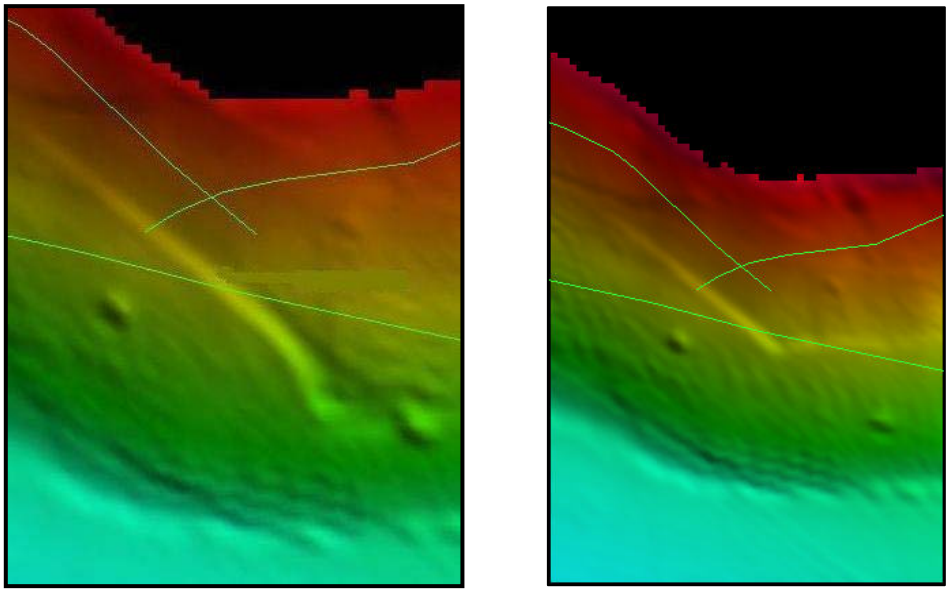


Figure 5. *Images of the systematic offset in the depth layer of the Caris BASE surface before and after beam rejection.*

B2.4.5 Sounding Coverage

Daily coverage was evaluated with DTM models created from preliminary, gridded sounding data. SAIC submitted 2-meter shoal-biased binned data for launches R2 and D2. Easting, Northing, Depth (E,N,d) data were imported into MapInfo and re-gridded in Vertical Mapper. DTMs were subsequently evaluated for preliminary coverage and delineation of the 8-meter inshore limit. Final sounding coverage was evaluated in Caris using BASE surface DTM, TPE and sounding density models. Sounding density was low in deep water over 70 meters, with approximately 1 to 2 meter spacing between beams (Figure 6). This could account for striping observed in the standard deviation BASE surface model (Figure 7). Very minor horizontal position variations (less than 5-meter specifications) could account for vertical depth variation on the steeply sloping seafloor typical of the survey area.

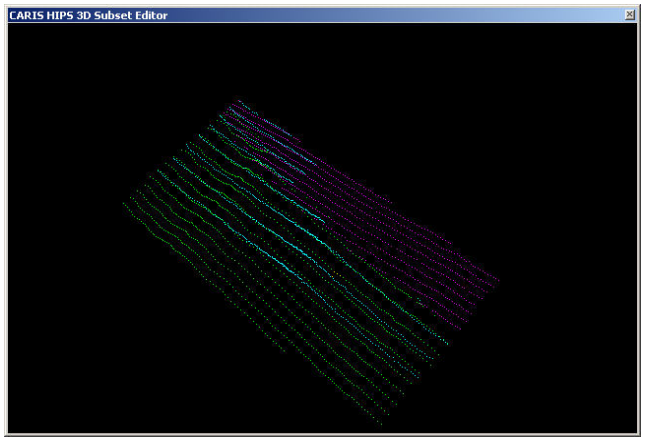


***Figure 6**. Deep water Beam Spacing in CarisHIPS 5.4 Subset Editor.*

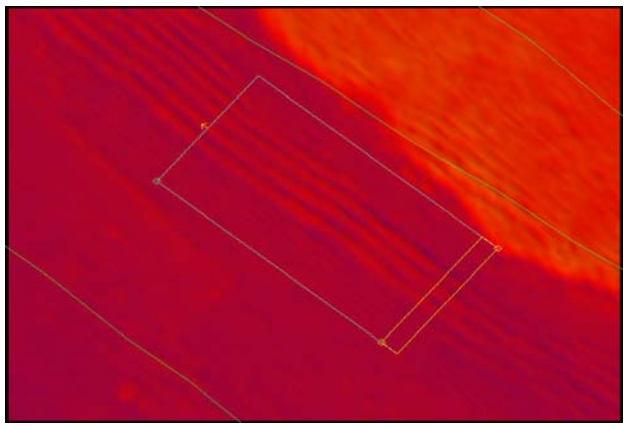


***Figure 7**. Deep water striping in the standard deviation layer of the Caris HIPS 5.4 BASE surface.*

B2.4.6 Swath Angle Filtering

All soundings were filtered to within 55 degrees of nadir by SAIC during multibeam echosounder bathymetry acquisition to increase confidence in sounding accuracy and minimize sound velocity errors. In some cases, outer-beam soundings were re-accepted for holidays and general bathymetry in deeper water to fill in small gaps in the final BASE surface.

Within Deep Inlet, outer beam data of lines acquired by survey launch D2 adjacent to the shoreline were re-accepted to delineate inshore areas and the 8-meter depth curve. The 8101 returns coverage up to 75 degrees from nadir in outer beams, providing greater inshore coverage. The steep slopes of the inlet sides necessitated SWMB acquisition in extremely close proximity to the shoreline. The sonar pulse from beams closest to shore, normally rejected by the swath angle filter, are reflected almost directly back to the transducer due to the steep slope of the walls, providing a good quality sounding. This signal return phenomenon contrasts with outer beam returns in gradually sloping shallow water where the signal is subject to greater noise interference, increased travel distance to the bottom and higher reflection away from the receiver by a larger incidence angle. Data were reaccepted in subset mode based on this reasoning and to better represent the slope and depth variation of the inlet walls. All soundings used to create the final base[7] surface met IHO Order 1 error tolerances.

B2.4.7 Total Propagated Error (TPE)

Raw soundings were not filtered for TPE. BASE surfaces were created from soundings filtered for TPE values that met IHO Order 1 tolerance. TPE filtering increased the confidence of sounding accuracy

based upon system parameter settings in the Caris Vessel Configuration File (.hvf). Caris configuration files were created from manufacturer system performance specifications and offsets provided by SAIC from the System Acceptance Test (SAT). Caris configuration files for the launches and ship were submitted to Hydrographic Systems and Technology Programs (HSTP) and Pacific Hydrographic Branch (PHB) for review and validation. TPE was viewed in Caris surface models to evaluate sounding accuracy and confidence for significant features and final coverage. Total propagated error for the survey ranged from 0.245 – 0.331 meters. All soundings are qualified by an associated TPE confidence value.

B3. Water Level Datum Reduction

HDCS sounding data were reduced to mean lower-low water (MLLW) using verified tides from the primary station at Sitka, AK (945-1600). Verified tides were adjusted for zoned range and amplitude correctors provided by CO-Ops as specified in the project instructions and illustrated in Figure 8.

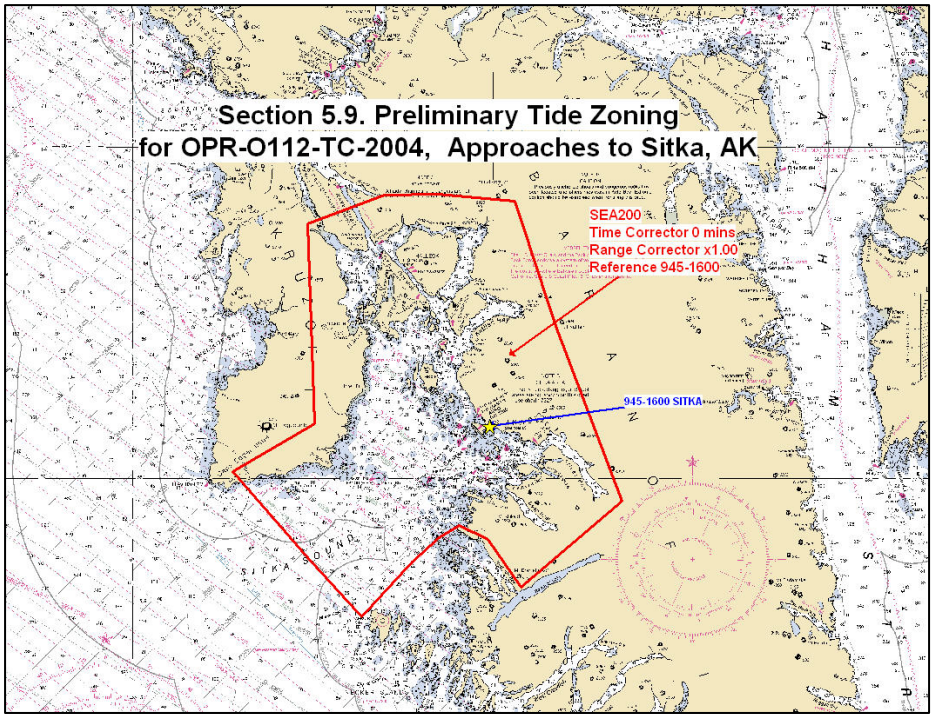


Figure 8. *OPR-O112-TC-04 Survey H11124 Tide Zoning Limits.*

These data and correctors were also used to reduce soundings and heights of detached positions (DPs) to MLLW when acquired relative to a local water-level datum.

All other datum reduction procedures conform to those outlined in the ***DAPR***.

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11124 can be found in the ***OPR-P139-TC-04 Horizontal and Vertical Control Report***,[8] submitted as an appendix to the DAPR. A summary of horizontal and vertical control for this survey follows.

C1.1 Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from U.S. Coast Guard beacons at Potato Point (323 kHz) and Hinchenbrook (288 kHz) were utilized during this survey. DGPS Confidence checks were performed daily by comparing positions acquired by primary (POS/MV) and secondary (Trimble MS 750) positioning systems on the ship and launches. Confidence checks were performed on the skiff by comparing Ceeducer DGPS positions with Trimble DGPS positions.

C1.2 Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Sitka, AK (945-1600) will serve as control for datum determination and as the primary source for water level reducers for survey H11124.

The Pacific Hydrographic Branch will apply final approved (smooth) tides to the survey data during final processing. A request for delivery of final approved (smooth) tides for this survey was forwarded to N/OPS1 on December 1, 2004 in accordance with the FPM and project letter instructions[9].

D. RESULTS AND RECOMMENDATIONS

D.1 Automated Wreck and Obstruction Information System (AWOIS) Investigations

One (1) AWOIS item was located within the limits of H11124 and investigated during this survey. Investigation methods, results, and charting recommendations have been entered into the Microsoft Access AWOIS database and are submitted with the digital data. A sunken wreck (PA) was reported in 1995 at 56° 59' 47.4" N, 135° 20' 16.8" W, but was not found following 100% SWMB coverage of the charted location and its surrounding area. It is recommended that the wreck be removed from chart 17326[10]. A pydro AWOIS .xml report is submitted with the PSS data.

D.2 Chart Comparison

Survey H11124 was compared with chart 17326 (13th Ed.; August 2000, 1:40,000)[11]. Chart comparisons were performed in MapInfo Professional 7.5 using xyz (E,N,d) sounding data exported from the final Caris BASE surface. Xyz data from the BASE surface were exported at 5-meter resolution from the finalized BASE surface. A MapBasic utility was used to evaluate BASE surface soundings within an appropriate search radius of the charted depth or feature. Chart comparison recommendations and comments are recorded as an attribute of a digital MapInfo radius table and compiled to a final chart comparison workspace and plot.

Chart 17326

Depths from chart 17326 generally agree with sounding depths from survey H11124, with differences less than 0.5 fathoms. Most shoaling patterns observed during chart comparison were adequately represented by the charted depths. However, several instances occurred where soundings shoaler than the surrounding charted soundings were found despite good agreement at the charted depths. All of the features discussed below were covered by 100% SWMB[12].

Within a 100-m radius of a charted 16-fathom sounding, the present survey revealed a depth of 9 fathoms at 56° 59' 52.62" N, 135° 18' 29.43" W. The 9-fathom sounding is the least depth of an uncharted shoal (Figure 9).[13]

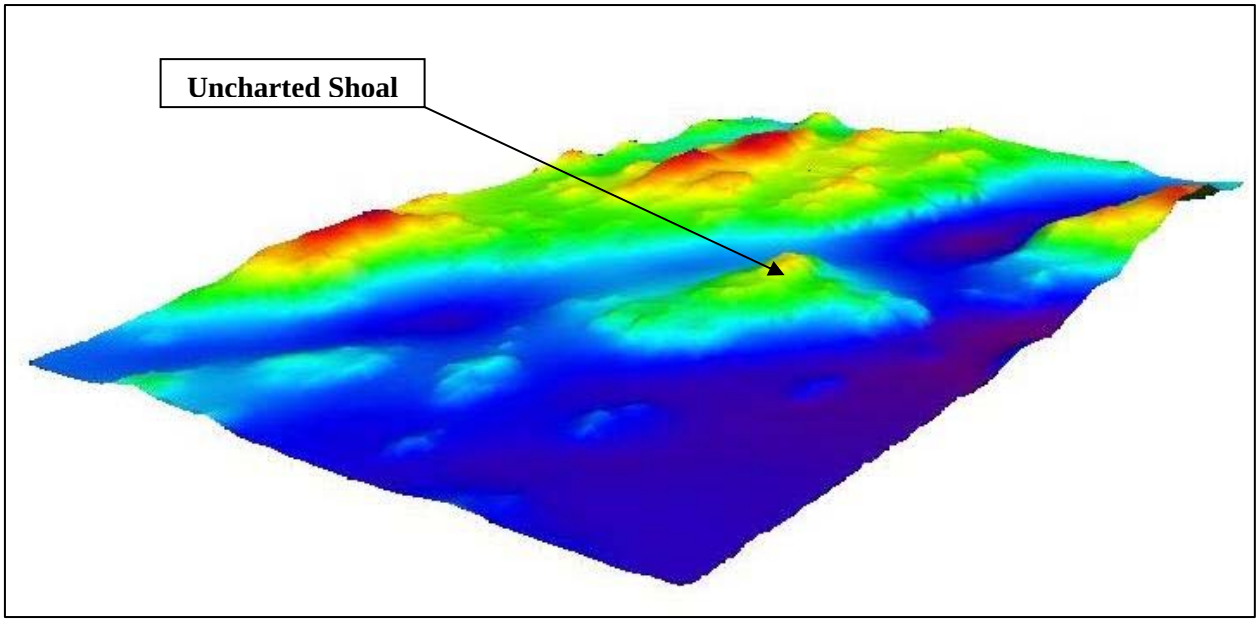


***Figure 9**. DTM of uncharted shoal with least depth of 9-fathoms shown in CARIS Subset Editor 3-D mode.*

In the vicinity of a charted 13-fathom sounding, the present survey revealed a depth of 8.7 fathoms at 56° 59' 57.47"' N, 135° 19' 10.74" W.[14]

Survey depths were found to be significantly deeper than charted depths in the southeast region or "foot" of Deep Inlet, specifically along the 20-fathom contour line (Figure 10). A 33-fathom sounding was found in the vicinity of a 20-fathom charted sounding at 56° 57' 01.51" N, 135° 13' 45.73" W. In the same proximity, a 38.4-fathom sounding was revealed over a charted depth of 26 fathoms at 56° 57' 01.28" N, 135° 14' 04.71" W. Depth differences could be attributed to modern survey methods and steep slopes encountered along the borders of the bay.[15]

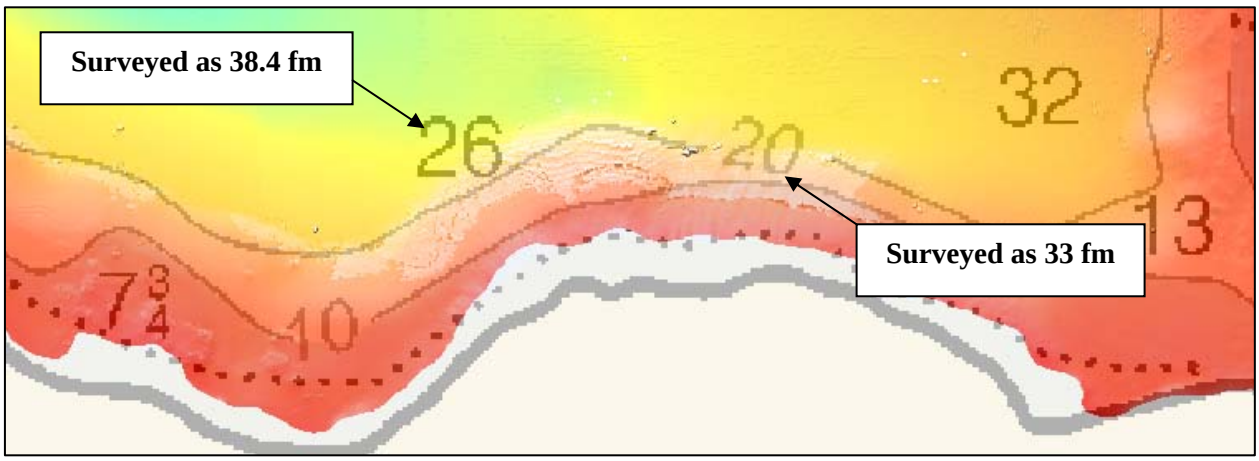


***Figure 10**. Evidence of survey depths significantly deeper than charted depths.*

Final sounding comparisons, selection and designations will be made after the application of smoothed tides.[16]

D.3 Shoreline

D3.1 Shoreline Source Data

Shoreline source data for this survey was compiled by the Remote Sensing Division (RSD) from photogrammetric surveys AK-9703A (North) and AK-9703B (South). Photogrammetry for this project was collected in 1997 and 1998. A project completion report is included as digital Adobe .pdf document (CM92012.pdf) with the project data.

Digital vector shoreline was provided on the project CD as individual cartographic feature files (CFF) in MapInfo format (.tab) files. Shoreline was delivered in two files: one with linear MHW and MLLW shoreline and one with point/line obstruction and rock features. The geographic datum for all source shoreline is NAD83.

Survey AK-9703A (NAD 83), 1997-98

CFF	Scale
GC-10516	1:20,000

Survey AK-9703B (NAD 83), 1997-98

CFF	Scale
GC-10517	1:20,000

RSD supplied shoreline digital manuscript objects were separated into S-57 feature classes through an evaluation of CFF attributes. Refer to the DAPR for a full description of shoreline source data processing and acquisition procedures. Additional features were digitized from electronic raster BSB charts and were used for reference purposes and chart evaluation.

The following electronic raster BSB was used for reference purposes for this survey:

Chart Number	ENC ID	Edition	Scale
17326	N/A	13th; August 2000	1:40,000

D3.2 Method of Shoreline Verification

Few low-water shoreline windows were available during daylight hours for this survey; therefore, many shoreline features were not observed during shoreline verification. Also, the lack of tide windows prevented proper verification of the MHW and MLLW lines as depicted in the source shoreline files and raster charts. Verification focused primarily on shoreline features, not the shoreline shape. Submerged shoreline features were surveyed at higher levels of tide with launch multibeam echosounders, skiff single beam echosounder and visual examinations.

Shoreline verification was conducted near predicted low water, when possible, in accordance with the Project Letter Instructions, Standing Instructions and the FPM. The general limit of safe navigation for the survey launches and skiff was five to twenty meters offshore of the apparent low-water line. Water depths along this limit of safe navigation were approximately eight meters at Mean Lower-Low Water

(MLLW). Significant features unsurveyable by launches were investigated when possible with the skiff and notes were annotated on hardcopy and digital shoreline fieldsheets.

Detached positions (DPs) acquired during shoreline verification surveys were recorded and attributed with a Trimble Pathfinder ProXRS differential-beacon global positioning system (DGPS) receiver. When possible, positions were collected directly over or next to the feature. At times, in order to efficiently utilize tide windows or for safety precautions, object positions were taken from a close distance. A visually estimated offset and a compass determined heading were entered into the GPS before position acquisition.

Generally, DPs were acquired to describe new features or changes to features in reference to the CFF source data or chart. Existing features that were accurately positioned in source data were verified in the field and annotated on hardcopy and digital fieldsheets. Features that were not observed by visual search were generally disproved or evaluated in echosounder or multibeam sounding coverage.

A detailed shoreline fieldsheet, in both paper copy and MapInfo format, is provided with the survey data, showing all detached positions with notes relating to each feature. Additions and changes to source and charted shoreline data were imported to and processed in Caris Notebook 2.2 Beta and are submitted as Caris .HOB files to be opened as a Notebook Field Plot and included in the final digital smooth sheet (H-Cell). Refer to the DAPR for a complete description of shoreline acquisition and processing procedures.

D3.3 Source Shoreline Changes and New Features

Shoreline features found during this survey generally matched those of the source and charted shoreline. The CFF shoreline was very accurate, requiring little revision. The following additions and changes were observed and are represented on the shoreline fieldsheet and in the final digital S-Cell:

Disprovals

The CFF fish facility, S-57 object class SLCONS, at 56° 57' 10.62" N, 135° 13' 11.34" W was disproved after conducting a visual search in calm sea conditions and obtaining 100% SWMB coverage of the area[17] (Table 1).

The CFF piles, S-57 object class PILPNT, located at 56° 57' 10.33", 135° 13' 21.43" and 56° 57' 4.06", 135° 13' 15.85" were disproved after conducting a visual search in calm sea conditions and obtaining 100% SWMB coverage of the area[18] (Table 1).

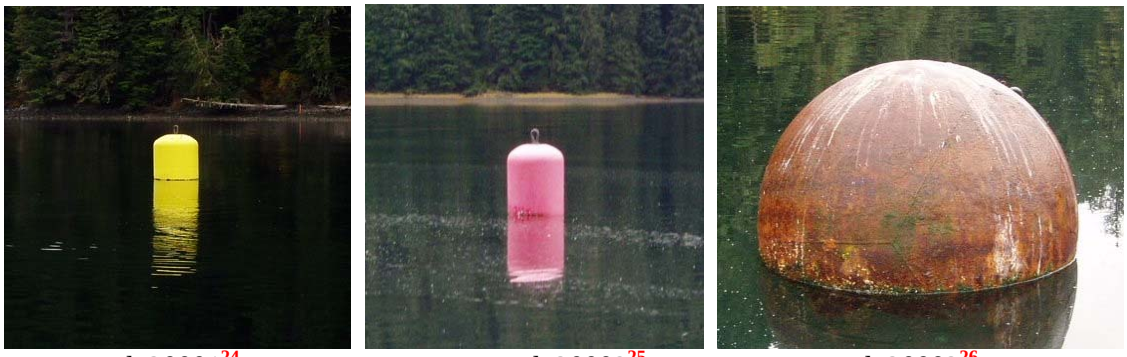
Soundings were designated in Caris HIPS 5.4 at these positions to aid in object disproval. The soundings selected for disproval were imported into Notebook 2.2 Beta, S-57 classified as SOUNDG and placed in the “Delete_Features” edit layer.

New Features

The extent of a new floating raft, S-57 object class SLCONS[19], was defined by circling the raft with the skiff and collecting positions with the Trimble Pathfinder DGPS receiver (Table 2). The western bound position was 56° 59' 36.6", 135° 18' 39.2112" and the eastern bound position was 56° 59' 37.5144", 135° 18' 37.3824" (Pos. # dp30001). The raft was constructed of wooden planks resting on plastic piping (Image 1). The status of the raft in regards to permanency is unknown.

***Image 1**. New SLCONS object, floating raft (dp30001)*

Positions of three new buoys, S-57 object class BOYSPP[20], located at the base of Deep Inlet were obtained by bringing the skiff alongside and collecting positions with the Trimble Pathfinder DGPS (Table 2). The buoys were located at the following positions: buoy dp30001[21] 56° 57' 9.40" N, 135° 13' 18.59" W; buoy dp30002[22] 56° 57' 7.41" N, 135° 13' 17.42" W; and buoy dp30003[23] 56° 57' 9.89" N, 135° 13' 6.86" W. The buoys may be privately owned and appear to be used primarily for mooring of small vessels (Image 2).



dp30001[24] *dp30002[25]* *dp30003[26]*

***Image 2**. New BOYSPP[27] objects located at the southeast corner of Deep Inlet.*

Positions of three rocks awash, S-57 object name UWTROC, were collected with the Trimble Pathfinder DGPS (Table 2). Depth estimates were collected visually in reference to the local datum, and were corrected to MLLW upon receipt of verified tides from CO-OPS. Coordinates and depths of each new UWTROC object are listed below:

- dp30005 - 56° 58' 55.32" N, 135° 18' 40.24" W, rock awash; depth estimated at 0.5 meter below the local datum.[28]

- dp30006 - 56° 58' 51.10" N, 135° 18' 42.91" W, rock awash; depth estimated at 0.2 meter below the local datum.[29]
- dp30007 - 56° 59' 9.54" N, 135° 19' 20.31" W, rock awash; depth estimated at 0.5 meter below the local datum. Extent of charted (17326) foul area.[30]

***Table 1**. Disproven CFF and Charted shoreline features within survey limits of H11124.*[31]

S-57 Object Name	*Shoreline Source*	*Position*		*Disproval Method*
		Latitude	*Longitude*	
SLCONS	CFF	56° 57' 10.62" N	135° 13' 11.34" W	100% SWMB
PILPNT	CFF	56° 57' 10.33" N	135° 13' 21.43" W	100% SWMB
PILPNT	CFF	56° 57' 4.06" N	135° 13' 15.85" W	100% SWMB
UWTROC	CH	56° 57' 12.14" N	135° 13' 10.32" W	100% SWMB
UWTROC	CH	56° 58' 45.93" N	135° 19' 23.44" W	Visual, VBES

***Table 2**. New S-57 shoreline features within survey limits of H11124.*

S-57 Object Name	*DP Number*	*Position*		*Description*
		Latitude	*Longitude*	
SLCONS	dp30001	56° 59' 36.61"N	135° 18' 38.71" W	Floating platform wood/plastic pipe
BOYSPP[32]	dp30002	56° 57' 9.40" N	135° 13' 18.59" W	Yellow plastic buoy
BOYSPP[33]	dp30003	56° 57' 7.41" N	135° 13' 17.42" W	Pink plastic buoy
BOYSPP[34]	dp30004	56° 57' 9.89" N	135° 13' 6.86" W	Brown metal buoy
UWTROC	dp30005	56° 58' 55.32" N	135° 18' 40.24" W	Rock awash
UWTROC	dp30006	56° 58' 51.10" N	135° 18' 42.91" W	Rock awash
UWTROC[35]	dp30007	56° 59' 9.54" N	135° 19' 20.31" W	Rock awash, Extent foul area

D3.3 Low-Water Shoreline

The low-water shoreline was not defined for this project. In most areas, the shoreline was steep and dropped off immediately to deep water.

D3.4 Charted Features

The charted (17326) rock located at 56° 57' 12.14" N, 135° 13' 10.32" W was disproved[36] after conducting a visual search in calm sea conditions and obtaining 100% SWMB coverage of the area (Table 1). A sounding was designated at this position with a recorded depth of 11.7 meters.

The charted (17326) rock located at 56° 58' 45.93" N, 135° 19' 23.44" W was disproved[37] after conducting a visual search in calm sea conditions with water visibility clear to the bottom (Table 1). The rock was located within the charted MLLW line, so the surrounding area was very shallow with soundings taken by the VBES ranging between 0.3 – 1.0 meter. This rock may have been charted as a warning to mariners of the shoal conditions.

Three charted rocks were delineated during post field processing through analysis of SWMB and VBES data of the survey area (Table 3). Soundings were selected and designated in Caris HIPS 5.4 and then imported into Notebook to mark the approximate position of the charted rocks.

Table 3. *Charted Rocks verified with SWMB and VBES systems.*[38]

S-57 Object Name	*Sounding Depth (m)*	*Position*		*Description*
		Latitude	*Longitude*	
UWTROC	0.2	56° 58' 52.21"N	135° 18' 36.37" W	CH Rock verified with VBES
UWTROC	5.1	56° 59' 35.79" N	135° 18' 46.50" W	CH Rock verified with SWMB
UWTROC	4.8	56° 59' 42.14" N	135° 18' 43.17" W	CH Rock verified with SWMB

Complete multibeam coverage was not obtained over the charted rocks observed in SWMB; however, Figure 11 below displays a shoaling trend indicative of a foul area as denoted by the rocks on Chart 17326. The soundings designated in Caris HIPS 5.4 were seaward of the least depths of the shoal.

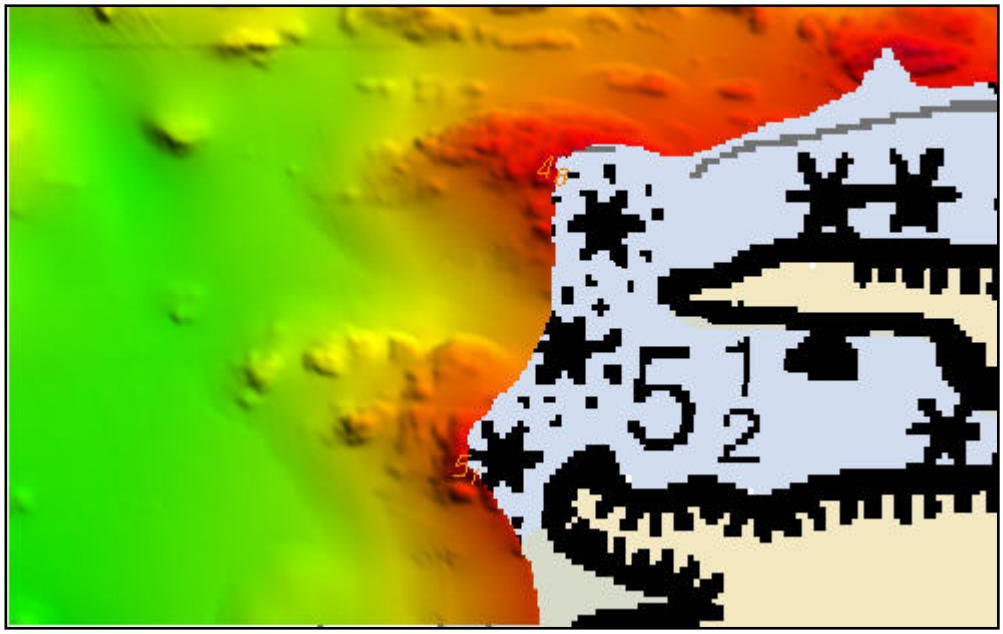


Figure 11*. Shoaling trend observed in Caris HIPS 5.4 BASE surface depth layer. Soundings were selected from SWMB data to verify outer extents of charted rocks.*

D3.5 Shoreline Recommendations

The Hydrographer recommends that the shoreline features included in the final S-Cell supersede and complement shoreline information compiled in the CFF and charts as noted. These revisions are included in the final digital database as S-57 format feature objects. Field notes, including verification of source features, are submitted with the hard copy shoreline fieldsheet. A shoreline plot prepared with Notebook 2.2 Beta and a digital version of the boat sheet prepared in MapInfo 7.5 is included with the survey data.

D.4 Dangers to Navigation and Shoals

D4.1 DTON

No dangers to navigation were reported for this survey.[39] Shoal soundings and features are listed and described in the following section.

D4.2 Shoals

At the entrance to Deep Inlet, there is a charted ¾ - fathom shoal.[40] Attempts were made for full development of the rock with SWMB, but 100% coverage was not obtained due to rough seas and strong currents. The rock blocks the southern approach to the inlet and its boundaries were defined with multibeam data (Figure 11). A least depth of 1.961 meters (1.07 fm) was recorded at 56° 59' 8.59" N, 135° 18' 21.17" W.[41]

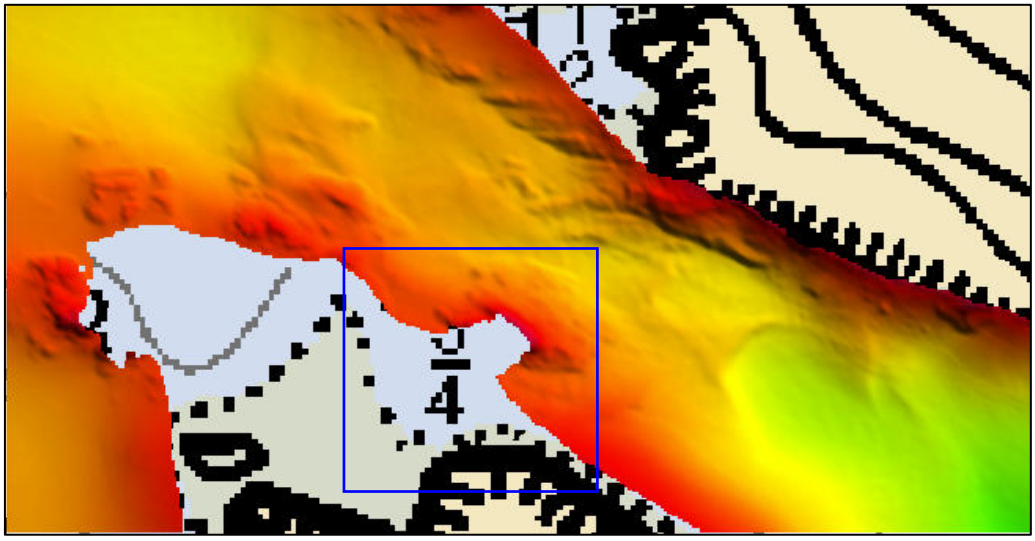


Figure 12. *3/4 – fathom shoal at the entrance to deep inlet (not fully developed).*

A 9-fathom shoal was located and developed with 100% multibeam coverage at 56° 59' 52.62" N, 135° 18' 29.43" W.

D.5 Aids to Navigation

No aids to navigation (ATONs) are located within the limits of H11124.

D.6 Coast Pilot Information

The listing for Deep Inlet in Coast Pilot 8 (26th Edition) indicates a large flat rock with a ¾ -fathom sounding located at the entrance that was verified by the present survey and discussed in greater detail under the heading of Shoals. The inlet is also documented as having no anchorage, which in general is true due to the deep waters and steeply sloping walls; however, at the southern end of the survey, bottom samples in depths under 40 fathoms yielded brown mud, suggesting anchorage potential (Table 3).[42] This shallow region of the inlet is well-protected from rough seas and could serve as a good anchorage area; however, passage of large vessels could be restricted by the rock at the entrance. The S/V DAVIDSON

navigated safely through the passage to collect bottom samples and recover the launches in a sheltered location.

Sample Name	*Depth (fm)*	*Classification*	*Position*	
			Latitude	*Longitude*
D2_p-2	12	Br Mud	56° 56' 56.10" N	135° 13' 19.40" W
DA_1	35	Br Mud/Sand	56° 57' 5.70" N	135° 13' 37.00 " W
D2_p-1	34	Br Mud	56° 57' 14.00" N	135° 13' 56.60" W
D2_p-3	13	Bl Sand	56° 56' 54.40" N	135° 14' 18.50" W

D.7 Miscellaneous

Bottom Samples
Bottom samples were collected in accordance with the HSSDM and are depicted as SBDARE objects in the final S-Cell or S-57 data exchange set. Samples consisted primarily of a combination of brown mud and sand.[43]

D.8 Statistics

Vessel	Survey day	Linear nmi	SVP	Bottom Samples
D2	**300**	**25.19**	**6**	**N/A**
R2	**300**	**1.25**	**1**	**N/A**
DP	**300**	**3.35**	**1**	**N/A**
D2	**301**	**25.27**	**9**	**N/A**
R2	**301**	**9.44**	**2**	**N/A**
D2	**302**	**13.68**	**8**	**N/A**
R2	**302**	**8.54**	**2**	**N/A**
DA	**302**	**N/A**	**N/A**	**10**
D2	**303**	**1.17**	**0 (see 302)**	**3**
R2	**303**	**9.30**	**1**	**N/A**

Survey totals:

Survey days	Linear nmi	Square nmi	SVP	Bottom Samples
4	**97.19**	**2.566**	**30**	**13**

D.9 Adequacy of Survey
This survey is considered complete and adequate to supercede prior surveys for requirements specified in the Project Letter Instructions.[44]

Recommendations for Additional Work

The charted ¾ fathom shoal at the entrance of Deep Inlet was not fully developed with this survey. Although a 1.961 meter (1.07 fm) depth was acquired at the seaward extent with this survey, the significance of this obstruction at the mouth of the inlet warrants complete investigation. The currents swell and surf at this location are complex and it is recommended that the area be surveyed with caution in seasonable conditions. These recommendations were forwarded to HSD Ops and the RAINIER so that the information would be available for possible operations in CY2005.

E. APPROVAL

As Lead Hydrographer, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition, Hydrographic Survey Guidelines, Field Procedures Manual and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2004.

The digital data and supporting records have been reviewed by me, are considered complete and adequate for charting purposes. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Survey H11124 is complete and adequate to supersede charted soundings within the scope of limits and operations.

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

Title	Date Sent	Office
Data Acquisition and Processing Report for OPR-O112-TC-04	TBD	N/CS34
Horizontal and Vertical Control Report for OPR-O112-TC-04	TBD	N/CS34
Tides and Water Levels Package for OPR-O112-TC-04	April 21, 2005	N/OPS1
Coast Pilot Report for OPR-O112-TC-04	TBD	N/CS26

Approved and Forwarded: David A Sinson

David A. Sinson
Physical Scientist, NOAA
Lead Hydrographer

In addition, the following individuals were also responsible for overseeing data acquisition and processing of this survey:

Assistant Survey Manager: Bonnie Johnston

Bonnie Johnston
ECO Intern, NOAA

Revisions Compiled During Office Processing and Certification

[1] Concur, with clarification. The paper copy of the Letter Instructions included in the survey folder was date stamped Sep 3 2004. The digital version located on the server was time stamped 09/22/2004.
[2] Filed with the project records.
[3] The BASE surfaces submitted were at 0.5, 2 and 5 meter resolution.
[4] Although the specifications require 5% crossline coverage, the cartographer concurs with the hydrographer that the geometry of the survey area made normal crossline acquisition problematical. Further, a thorough review of the data indicated that they were well within specifications.
[5] Concur, with clarification. Survey 11122, which junctions on the north and northwest boundaries of 11124, was not completed as part of this project and was reassigned to a RAINIER project and surveyed in 2005. Depth comparisons were performed using a Difference Surface in CARIS BASE Editor between the 5m combined surface from 11124 and the 10m combined surface from 11122. With a very few exceptions, agreement in the area of overlap between the two surveys ranges from near zero to less than one fathom, despite the fact that comparison was performed between BASE surfaces at different resolutions (5m vs. 10m). Disagreements larger than one fathom were of one grid cell in size and limited to areas of high bottom relief or areas along the boundary of one of the two surveys being compared.
[6] BASE.
[7] BASE.
[8] Filed with the project records.
[9] The Final Tide Note is attached to this report.
[10] Concur.
[11] The northernmost 0.25km to 0.8km of the surveyed area lies on the southern portion of the adjacent Chart 17327 (22nd Ed., July 2005, 1:10,000). In accordance with OCS HCell Specifications, Version 2.0, April 2, 20997, compilation will performed at a scale of 1:10,000, which reflects "the largest scale chart in the area...." In addition, survey H11124 was compared to Chart 17327 at PHB, showing generally very good agreement. The few exceptions were the identification in the survey data of the least depths of several charted shoal areas as a result of the increased density of SWMB data over prior surveys. These exceptions predominantly showed least depths shoaler than previously charted values ranging from approximately four feet to as much as 3 fathoms 4 feet. Two charted small shoal areas were found to have shoalest points deeper than previously measured by two and five feet, respectively, and the least depths are included in the HCell sounding set.
[12] Concur.
[13] Concur.
[14] Concur.
[15] Concur.
[16] Concur. Final approved water levels were applied at PHB.
[17] Concur.
[18] Concur.
[19] Concur with clarification. The feature object appears to be a mariculture raft, whose proper S-57 characterization is MARCUL. Chart as shown in the HCell.
[20] These three features are privately maintained mooring buoys, the proper S-57 characterization of which is MORFAC, rather than BOYSPP. Strike "~~BOYSPP~~". Insert "MORFAC".
[21] Strike "~~dp30001~~". Insert "dp30002".
[22] Strike "~~dp30002~~". Insert "dp30003".
[23] Strike "~~dp30003~~". Insert "dp30004".
[24] Strike "~~dp30001~~". Insert "dp30002".
[25] Strike "~~dp30002~~". Insert "dp30003".
[26] Strike "~~dp30003~~". Insert "dp30004".
[27] Strike "~~BOYSPP~~"; insert "MORFAC".
[28] Concur. Chart rock.

[29] Concur. Chart rock.
[30] Concur with clarification. Although the rock was visibly apparent, it is in an area marked on the existing chart as a danger area containing a number of charted rocks. The newly found rock is not the seaward most extent of the danger area, and based on consultation with the hydrographer it is not the highest rock in the danger area. This object was not compiled to the HCell. The evaluator recommends that this rock not be charted.
[31] Concur with disprovals in Table 1.
[32] Strike "~~BOYSPP~~". Insert "MORFAC".
[33] Strike "~~BOYSPP~~". Insert "MORFAC".
[34] Strike "~~BOYSPP~~". Insert "MORFAC".
[35] See endnote 30, above.
[36] Concur.
[37] Do not concur. Although the rock was not seen visually, consideration of the launch track, which was a reconnaissance line, and the adequacy of coverage of VBES data over the rock's charted position are not deemed sufficient to establish disproval. Retain as charted.
[38] Concur with items in Table 3. Retain as charted.
[39] Concur.
[40] Strike "~~shoal~~". Insert "rock".
[41] Retain charted 3/4fm Rock and associated danger curve. Add danger curve to the ENC.
[42] Strike "~~Table 3~~". Insert "the following table".
[43] Concur, with clarification. In addition to the 4 bottom samples detailed in the table in the preceding section, there were 9 other bottom samples collected in Deep Inlet, all of which are included in the HCell and identified in the Blue Notes.

Further, during chart comparison, nine rocky ("rky") areas were identified on Chart 17327. None of these are present in the current ENC. They are explicitly identified in the Blue Notes. Recommend that they be carried forward from Chart 17327 and also added to the ENC.

[44] Concur.
[45] Concur.

H11124 AWOIS

Registry Number: H11124

State: Alaska

Locality: Sitka Sound

Sub-locality: Deep Inlet

Project Number: OPR-O112-TC-04

Survey Dates: 10/26/2004 - 10/29/2004

Charts Affected

Number	Version	Date	Scale
17326	13th Ed.	08/05/2000	1:40000
17320	16th Ed.	12/01/2003	1:217828
16016	20th Ed.	11/01/2003	1:969756
531	22nd Ed.	03/01/2004	1:2100000
500	8th Ed.	06/01/2003	1:3500000
530	30th Ed.	03/23/2002	1:4860700
50	6th Ed.	06/01/2003	1:10000000

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS	[no data]	[no data]	[no data]	---

1 - Item Data

1.1) AWOIS #53140 - Charted Wreck Not Found

No Primary Survey Feature for this AWOIS Item

Search Position:	56° 59' 47.400" N, 135° 20' 16.800" W
Historical Depth:	[None]
Search Radius:	100
Search Technique:	[unknown]
Technique Notes:	[unknown]

History Notes:

[unknown]

Survey Summary

Charts Affected: 17326_1, 17320_1, 16016_1, 531_1, 500_1, 530_1, 50_1

Remarks:

Charted Wreck Not Found. 100% multibeam coverage was acquired over the charted location and its surrounding area without evidence of AWOIS item.

Hydrographer Recommendations

Chart Removal

S-57 Data

[None]

Office Notes

Concur with recommendation. Remove chart wreck from chart. Added blue note to remove charted wreck.

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : May 19, 2005

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O112-TC-2004
HYDROGRAPHIC SHEET: H11124

LOCALITY: Deep Inlet, Sitka Sound, AK
TIME PERIOD: October 26 - October 29, 2004

TIDE STATION USED: 945-1600 Sitka, Alaska
Lat. 57 03.1'N Long. 135 20.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.791 meters

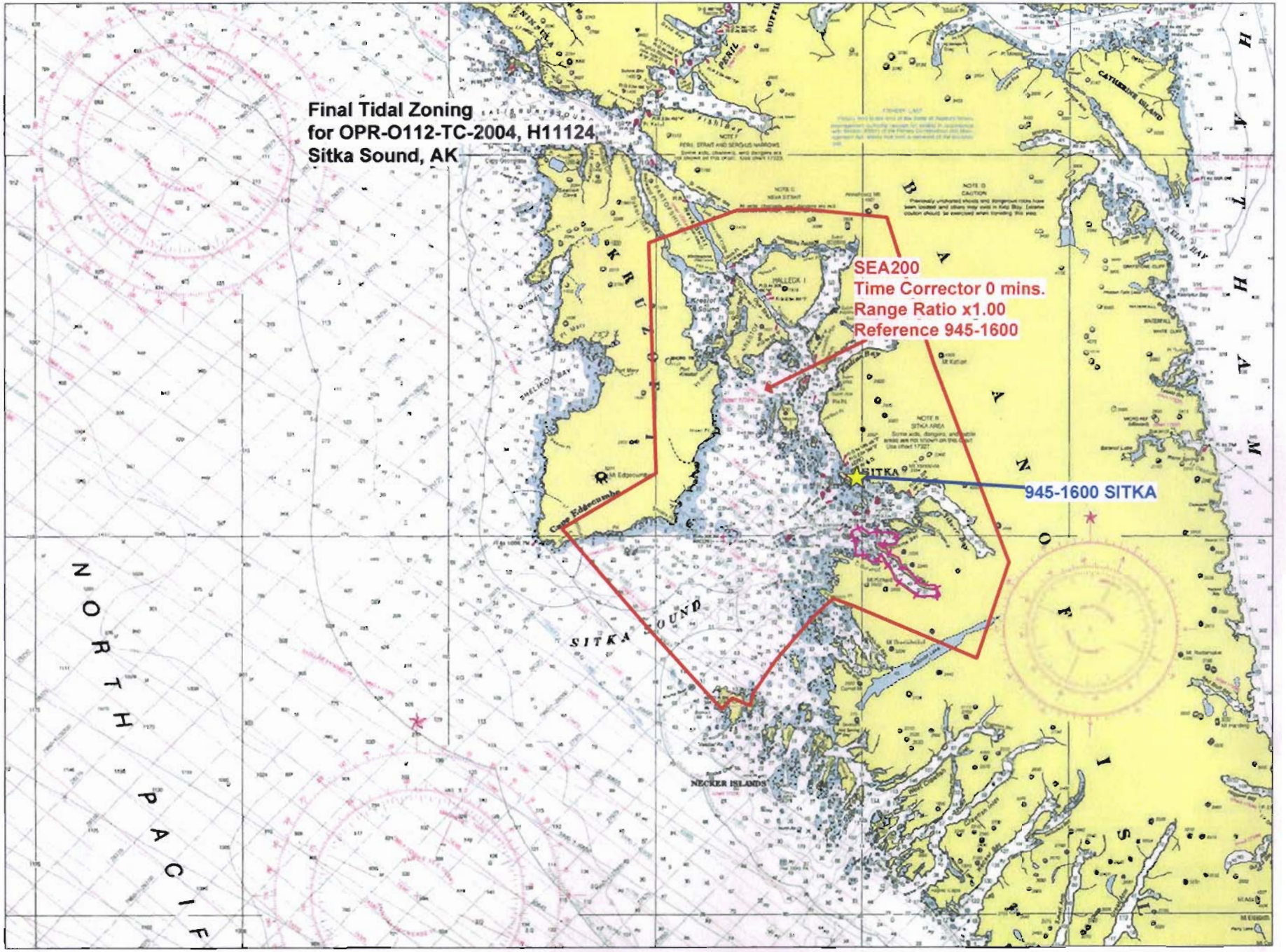
REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA200

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Thomas N. Neu 5/20/05

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION


Final Tidal Zoning
for OPR-O112-TC-2004, H11124
Sitka Sound, AK
SEA200
Time Corrector 0 mins.
Range Ratio x1.00
Reference 945-1600
945-1600 SITKA
SITKA
SITKA SOUND
NORTH PACIFIC
BARANOF ISL
KRUZOF
NECKER ISLANDS

Final tide zone node point locations for OPR-O112-TC-2005

Format: Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction
Longitude in decimal degrees (negative value denotes Longitude West),
Latitude in decimal degrees

	Tide Station Order	AVG Time Correction	Range Correction
SEA200	945-1600	0	x1.00

-135.578921 56.858887
-135.484815 56.914845
-135.434312 56.939104
-135.398646 56.951288
-135.345146 56.937479
-135.283101 56.889312
-135.096503 56.976245
-135.219418 57.152377
-135.294235 57.2785
-135.435854 57.285735
-135.536277 57.284567
-135.677763 57.256337
-135.665367 57.054404
-135.816846 57.006056
-135.678821 56.918667
-135.578921 56.858887

H-11124 HCell Report

K. Toepfer, Physical Scientist
Pacific Hydrographic Branch

Introduction

The primary purpose of the HCell is to directly update NOAA ENCs with new survey information in International Hydrographic Organization (IHO) format S-57. HCell compilation of survey H11124 utilized OCS HCell Specifications Version 2.0 (April 2, 2007). HCell H11124 will be used to update ENC US5AK3VM and chart 17327, 1:10,000 (22nd Ed.; Jul, 2005, NM 07/02/2005). In the process of combining the finalized BASE surfaces the Contributor layer of the resulting Combined surface extended well beyond the limits of survey data. On the advice of CARIS Help Desk staff, a subset of that Combined surface was extracted from it based on the boundaries of the depth layer of the BASE surface, using the *Extract Surface Tool* of BASE Editor.

1. Compilation Scale

Soundings are compiled at a density appropriate to emulate those of Chart 17327, 1:10,000. Position and density of features included in the HCell have not been generalized from the scale of the hydrographic survey, 1:10,000, or GC shoreline 1:20,000.

2. Soundings

2.1 Source Data

A 5 m resolution Combined BASE surface, **`H11124_CombExt_5m_phb`** was used as the basis for HCell production following Branch certification. This surface contained six designated soundings, none of which were considered to be DTONs by the field or the branch.

A survey-scale full density sounding (SOUNDG) feature object source layer was built from the **`H11124_CombExt_5m_phb`** surface in CARIS BASE Editor. Shoal-biased soundings were selected using radius values (in mm at survey scale) by depth range (in meters) as shown in Table 1. The sounding feature object source layer was exported as **`H11124_Soundings_SS_FullArea.hob`**, and imported into HOM.

Table 1

From (m)	To (m)	Radius (@ 1:10,000)
0.0	10	3mm
10	20	4mm
20	50	4.5mm
50	105	5mm

2.2 Sounding Feature Objects

The *Import Selected Objects* Tool in CARIS BASE was used to select soundings manually from the survey scale sounding set to generate a shoal-biased chart density sounding set.

3. Contours and Depth Areas

3.1 Source Data

Contours were created using a routine in BASE Editor to assist in manual selection of chart scale soundings, being particularly useful to ensure that small shoal areas are neither overlooked nor attributed with a depth other than the shoalest depth. Not being a deliverable these are not included in the submitted HCell.

In accordance with OCS H-Cell Specification Version 2.0, the sole coterminous area of soundings in this survey was enclosed within a single depth area whose DRVALs were the shoalest and deepest depths contained within the BASE surface.

The sole departure from OCS H-Cell Specification Version 2.0 in HCell H11124 is the omission of “islands” of coverage for three new Feature Objects (the two new UWTROC objects, one new MARCUL object) and one revision to the GC shoreline vector (a section of the 0m contour of GC shoreline to agree with the southwesternmost new UWTROC). This departure was made in anticipation of the elimination of such “islands of coverage” expected to be contained in OCS H-Cell Specification Version 3.0.

3.2 Contour and Depth Area Feature Objects

The sole Depth Area feature object, which encompasses all sounding data, required substantial editing of its spatial boundary to remove small overlaps with the GC shoreline along the shores of Deep Inlet. In all cases these were evaluated as arising from small overlaps of an arbitrarily located 5m grid with very steep shoreline bathymetry, and in no case required the removal of more than a substantial fraction of one 5m grid cell.

4. Meta Areas

The following Meta object areas are included in HCell H11124:

M_QUAL
M_COVR
M_NSYS

Meta area objects were constructed from filtered perimeter lines duplicated from the SOTE layer and attributed per the OCS H-Cell Specifications, Version 2.0.

5. Survey Features

All Feature objects included in the HCell were obtained from survey H11124. With one exception these were imported directly from Notebook files submitted with the survey. The exception was the new MARCUL object located at 56°59’ 36.97”N 135° 18’ 38.39”W. This Feature was captured in the field as a line object partially circumscribing object by driving a Trimble backpack GPS around it in a skiff. This line object was included in the appropriate CARIS Notebook file and imported into HOM therewith. Discussions with the PS and examination of the image supplied in the DR established that the object was rectangular. This line object was replaced with a rectangular polygon

digitized during compilation, and approximately circumscribed by the original line object. It is marked by a Blue Note.

6. Shoreline / Tide Delineation

The nearest tide gauge was located at 57° 03.1'N / 135° 20.5'W (Sitka, Alaska), with a MHW elevation of 2.791 meters. The MHW elevation found in the ENC is 2.7 meters above MLLW.

With the exception of the one small edit to GC Shoreline made during compilation and discussed above in Section 3.1, no shoreline was included in the compilation.

7. Attribution

All S-57 Feature Objects have been attributed as fully as possible based on information provided by the Hydrographer and in accordance with OCS HCell Specifications Ver. 2.0.

8. Layout

8.1 CARIS Layer Numbers

H11124_HC

100	Soundings (chart density)
102	Designated Soundings
200	Group 1 objects (Skin of the Earth)
300	Point objects (new UWTROC)
301	Point objects (new SBDARE Bottom Samples)
302	Point objects (new MORFAC)
501	Area objects (MARCUL, per verbal information from PS)
502	Line object (MARCUL, as recorded)—spatial mode only
600	M_COVR
601	M_NSYS
601	M_QUAL
800	Blue Notes

8.2 Blue Notes

Notes regarding data sources are in layer 800 and included as Shapefile sets **H11124_bluenotes_p** and **H11124_bluenotes_l** (with the appropriate extensions) for point and line figures, respectively. A copy of the survey perimeter is included in the line shape file set for orientation purposes.

9. Spatial Framework

9.1 Coordinate System

All spatial map and base cell file deliverables are in an LLDG geographic coordinate system, with WGS84 horizontal, MHW vertical, and MLLW (1983-2001 NTDE) sounding datums.

9.2 Horizontal and Vertical Units

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

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

Fathoms and feet are in the format X.YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. For fathoms.feet shoaler than 11 fathoms, soundings round to the deeper foot if the decimals of the foot are X.Y75000 or greater. For fathoms.feet equal to, or deeper than, 11 fathoms, soundings round to the deeper fathom if feet and decimals of the foot are X.45000 or greater, because 4.5 feet is equal to 0.75 fathoms.

HOM Units

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

Chart Unit Base Cell Units

Depth Units (DUNI):	Fathoms and feet
Height Units (HUNI):	Feet
Positional Units (PUNI):	Meters

10. QA/QC

10.1 Data Processing Notes

A bug relating to sounding display has been discovered in CARIS HOM version 3.3, Service Pack 3, and BASE Editor, version 1.0. Both involve display of sounding values and depths on submerged features, such as rocks. However, with one exception, it has been found that this is limited to display of features in CARIS products, and the integrity of values in the base cell file deliverable are un-corrupted. One exception is a single instance of a 5 fathom submerged rock being displayed in all tested ENC viewers as 4 fathoms 6 feet. This feature has been included with the Blue Notes.

10.2 ENC Validation Checks

H11124 was subjected to QA and Validation checks in HOM prior to altering the VALDCO and DRVALs, as required to meet OCS HCell Specifications 2.0. (See Sec.

3.2, Contour and Depth Area Feature Objects.) Full millimeter precision was retained in the export of the metric S-57 base cell data set (000 file). This data set was then converted to a chart unit 000 file. dKart Inspector 5.0 was then used to further check the data set for conformity using the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and errors investigated and corrected where necessary.

11. Products

11.1 MCD Deliverables

- H11124 Base Cell File, Chart Units, Soundings compiled to 1:40,000
- H11124 Base Cell File, Chart Units, Soundings compiled to 1:10,000
- H11124 Base Cell File, Chart Units, New Feature Objects
- H11124 Descriptive Report including end notes compiled during office processing and certification
- H11124 HCell Report
- Blue Notes shape files

11.2 File Naming Conventions

HOM file set prefix: *H11124_hc*

MCD Chart units base cell file: *US511124_CS.000*

MCD Chart units base cell file, survey scale soundings: *US511124_SS.000*

MCD Features base cell file, Feature objects: *US511124_Features.000*

11.3 Software

HIPS 6.0:	Management and inspection of Combined BASE surfaces
BASE Editor 1.0:	Combination of Product Surfaces and initial creation of the S-57 bathymetry-derived features
BASE Editor 2.1	Preparation of the QA BASE Editor Session, sounding selection Modifications resulting from QA by supervisor and Branch chief
HOM 3.3:	Assembly of the HCell, S-57 products, QA
GIS 4.4a:	Setting the sounding rounding variable, export of Blue Notes
dKart Inspector 5.0:	Validation of the base cell file

12. Contacts

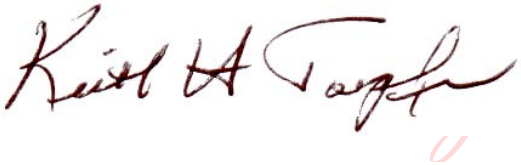
Inquiries regarding this HCell content or construction should be directed to:

Keith Toepfer, Physical Scientist, PHB, Seattle, WA; 206-526-6877;
Keith.Toepfer@noaa.gov.

APPROVAL SHEET
H11124

Initial Approvals:

The survey evaluation and verification has been conducted according to branch processing procedures and the HCell compiled per the latest OCS HCell Specifications.



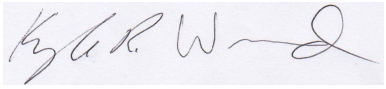
Digitally signed by Keith H. Toepfer
Date: 2008.03.31 11:37:46 -07'00'

The survey and associated records have been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, S-57 classification and attribution of soundings and features, cartographic characterization, and verification or disproval of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

Digitally signed by Gary C. Nelson
DN: cn=Gary C. Nelson, c=US, o=NOAA, ou=Pacific Hydrographic Branch, email=gary.nelson@noaa.gov
Date: 2008.03.31 12:03:30 -07'00'

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.

David Neander
2008.03.31
13:27:44 -07'00'



Kyle R. Ward
AWOIS and SURF check
2008.04.01 09:43:13 -04'00'