H11392

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. H11392

LOCALITY

State Alaska

General Locality Prince William Sound

Sublocality Port Bainbridge

2004

CHIEF OF PARTY

David A. Sinson, NOAA

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H11392

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: Prince William Sound

Sublocality: Port Bainbridge

Scale: 1:10,000

Dates of Survey: Sept. 23 - Oct 21, 2004

Instructions Date: 9/22/2004

Project No.: OPR-P139-TC-04

Vessel: R/V DAVIDSON Survey launches R2 and D2

Chief of Party: PS David A. Sinson, NOAA

Surveyed by: SAIC Personnel

Soundings taken by echo sounders: Reson Seabat 8111ER, Reson 8125 HRSWMB, 8101 SWMB

Graphic record scaled by: Davidson Personnel

Graphic record checked by: Davidson Personnel

Evaluation by: M. Herzog, G. Nelson, C. Barry

Automated plot by: N/A

Verification by: G. Nelson, C. Barry

Soundings in: Fathoms at MLLW

REMARKS: Time in UTC. UTM Projection Zone 6

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 H11392

Project OPR-P139-TC-04
Port Bainbridge
Prince William Sound, Alaska
Scale 1:10,000
September-October 2004
NOAA Time Charter R/V DAVIDSON
Lead Hydrographer: PS David A. Sinson, NOAA
Survey Manager: PS David A. Sinson, NOAA

A. AREA SURVEYED

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P139-TC-04, dated September 22, 2004, and the Draft Standing Project Instructions dated March 23, 2004. The survey area includes the entrance to Port Bainbridge and Prince William Sound, Alaska. H11392 junctions with survey H11391 and H11393, conducted concurrently at the northern and southern limits.

Northern Limit	Southern Limit	Western Limit	Eastern Limit
60º01'43.5"N	59º55'57.4"W	148º27'28.5"W	148º18'39.2"W

Data acquisition was conducted from September 23 to October 21, 2004 (Julian day numbers 266 to 295).

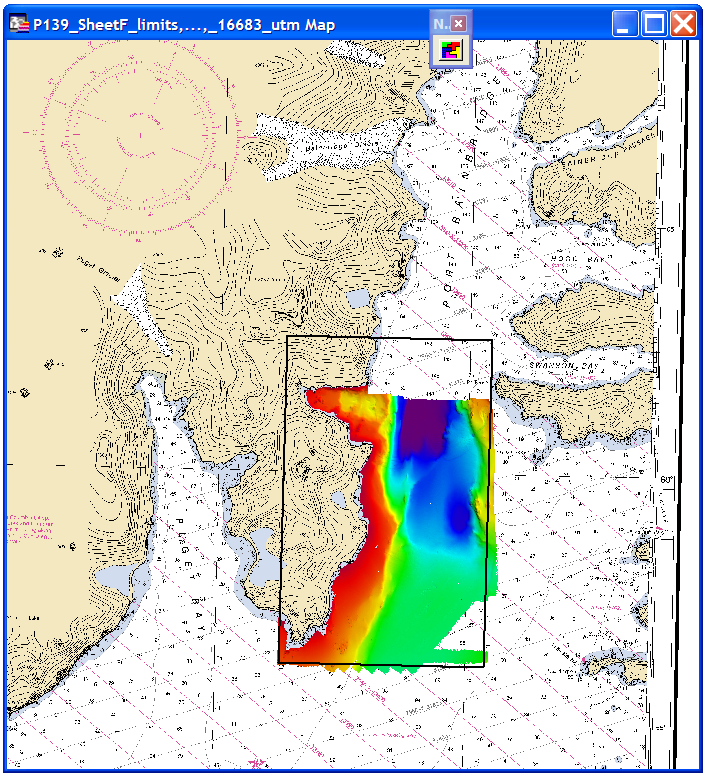


Figure 1 OPR-P139-TC-04 Survey H11392 limits and coverage

B. DATA ACQUISTION AND PROCESSING

Refer to ***OPR-P139-TC-04 Data Acquisition and Processing Report (DAPR)***[1] for a complete description of data acquisition and processing systems, survey vessel, 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 Vessel

All data were acquired by the R/V DAVIDSON and survey launches R2 and D2. Vessel configuration, 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.

B2.2 Crosslines

Multibeam echosounder crosslines totaled 10.85 nautical miles, comprising 4.8% of Shallow Water Multibeam (SWMB) hydrography.[2] Crossline soundings were evaluated with respect to main scheme soundings in CARIS HIPS subset area editor and a gridded base surface model. In general, there was excellent agreement between mainscheme and crossline soundings. Observed sounding differences were generally less than 1 meter in less than 100 meter water depths and no significant systematic, sound velocity, or water level offsets were observed in the crossline evaluation.

B2.3 Junctions

The following contemporary surveys junction with H11392:

Registry #	Scale	Date	Junction side
H11172	1:10,000	2002	East
H11391	1:10,000	Concurrent	North
H11391[3]	1:10,000	Concurrent	South

Junction survey soundings For H11172 were provided by the Pacific Hydrographic Branch in Microstation .dgn format. Junction analysis was performed in CARIS HIPS Fieldsheet editor; .dgn files were converted to CARIS maps and imported as background files for subsequent comparison with BASE surface soundings. Comparisons were made with verified tides applied to the data. Survey H11172 junctions very well with this survey; differences are generally less than one fathom in 33 to 120 fathoms water depths. Figure 2 displays the boundaries of the junction survey. H11392 junctions with survey H11391, conducted concurrently at the northern limits, and H11393, conducted concurrently at the southern limits. Complete coverage was acquired with concurrent surveys.

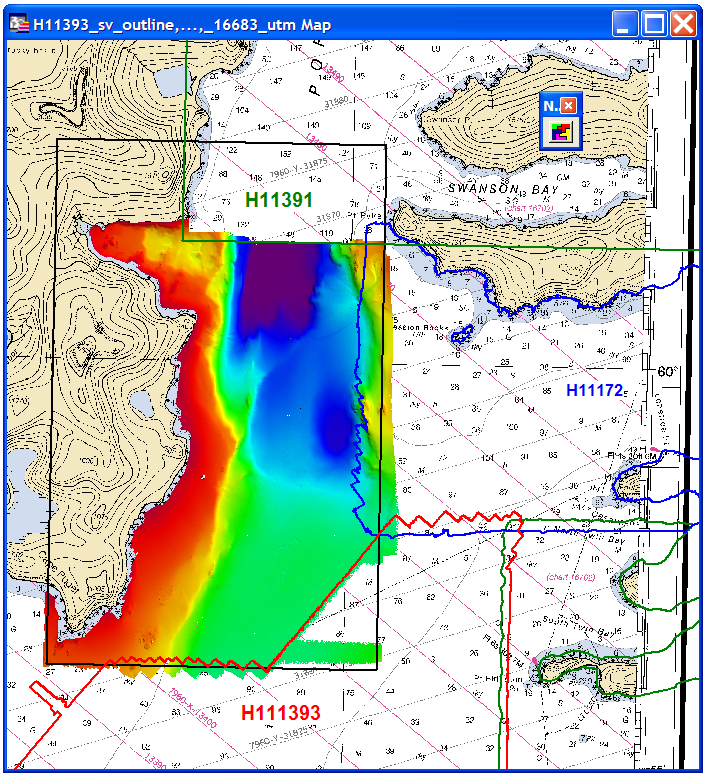


Figure 2. H11392 Junction Surveys

B2.4 Data Quality Factors

Caris QC review BASE surfaces were created at 5-meter resolution for ship soundings and 2 meter resolution for the launch soundings. BASE surfaces were used to focus full-density sounding evaluations and editing in areas of high standard deviation and total propagated error (TPE). Sounding subsets were evaluated in areas of high topographic relief to ensure that the depth BASE surface accurately represented shoal soundings and features. Significant soundings were designated from full raw data to ensure representation in the final BASE surface models.[4]

B2.4.1 Sound Velocity Profiles

ISS2000 applies 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 the DAVISDON with the Reson 8111ER to ensure correct beam formation. Surface sound velocity was used by the 8125 system for correct beam formation on the flat-faced transducer for directional accuracy, and on the 8111ER for correct beam formation for pitch stabilization. Changes in surface sound velocity were also evaluated as an indicator of changes in the water column sound velocity. In general, there was good agreement of depths between overlapping outer beams of survey lines. There is no indication of significant sound velocity errors in the final base surface.

B2.4.2 Water level correction

ISS2000 applies predicted water-level correctors with CO-OPS supplied zoning in real-time during echosounder acquisition. Observed tides from the primary tide gauges are applied to soundings prior to NOAA quality review in CARIS HIPS/SIPS. Soundings from crosslines and overlapping lines were examined in 3-D sounding subsets and base 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

CARIS BASE surfaces were evaluated by NOAA hydrographers 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 in areas of unusually high standard deviation and flagged as rejected. The total range of standard deviation was 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. In general, NOAA quality review required minimal editing and any significant quality deficiencies were corrected before final submission.[5]

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. There were no significant systematic errors observed during review of this survey.

B2.4.5 Sounding Coverage

Daily coverage was evaluated with DTM models created from preliminary, gridded sounding data. SAIC submitted 5-meter resolution, shoal-biased binned data for the ship and 2-meter resolution, shoal-biased data for the launches. Easting, Northing, depth data were imported into MapInfo and re-gridded in Vertical Mapper. DTMs were subsequently evaluated for significant features, coverage and a preliminary assessment of data quality. Final sounding coverage was evaluated in CARIS using BASE surface DTM, TPE and sounding density models.

B2.4.6 Swath Angle Filtering

All soundings were filtered (flagged as offline) by SAIC processing software (ISS-2000) to within 55 degrees of nadir for multibeam echosounder bathymetry 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. All data used to create the final base surfaces were filtered to meet IHO Order 1 quality 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 HIPS Vessel File (.hvf). The HVF was created from manufacturer system performance specifications and offsets provided by SAIC from the System Acceptance Test (SAT). CARIS configuration files for the ship were submitted to HSTP and 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 0.24 – 2.1 meters in depths from 1 – 275 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 stations at Cordova (945-4050) and Seward (945-5090). Verified tides were adjusted for zoned range and amplitude correctors provided by CO-Ops as specified in the project instructions and illustrated in Figure 4.

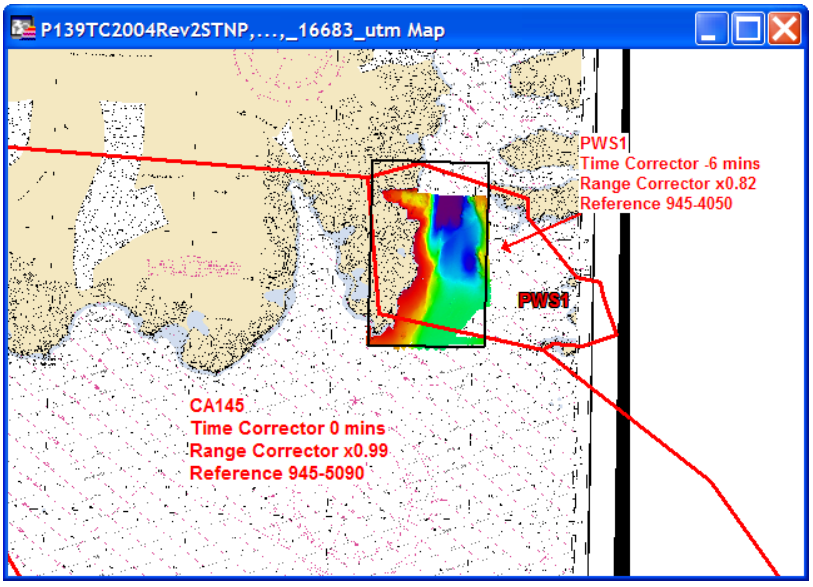


Figure 4. Tide Zoning for H11393

C. VERTICAL AND HORIZONTAL CONTROL

A complete description of vertical and horizontal control for survey H11393 can be found in the ***OPR-P139-TC-04 Horizontal and Vertical Control Report***.[6] A summary of horizontal and vertical control for this survey is included in the following sections.

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 Hichenbrook (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.

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 stations at Cordova, AK (945-4050) and Seward, AK (945-5090) will serve as control for datum determination and as the primary source for water level reducers for survey H11392.

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 01, 2004 in accordance with the FPM and project letter instructions.[7]

D. RESULTS AND RECOMMENDATIONS

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

No AWOIS items were assigned to this survey.[8]

D.2 Chart Comparison

Survey H11392 was compared with charts 16683 (10th Ed.; Feb, 2004, 1: 81,436), shown in figure 5.[9] Chart comparisons were performed in MapInfo using xyz (E,N,d) sounding data exported from the final QC base surface. Xyz data from the base surface were exported at 5-meter resolution from the finalized base surface. Base surface soundings were evaluated within an appropriate search radius of the charted depths and features. Chart comparison differences and comments were recorded as an attribute of a digital MapInfo radius table and compiled to a final chart comparison workspace and plot.

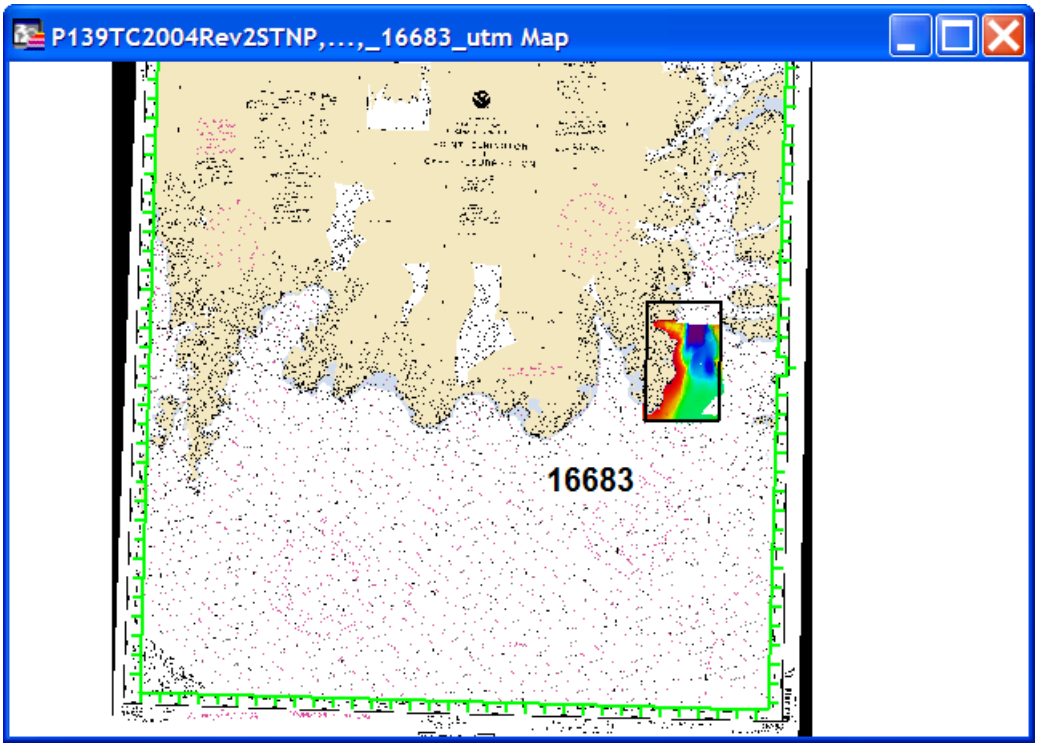


Figure 5. Chart 16683

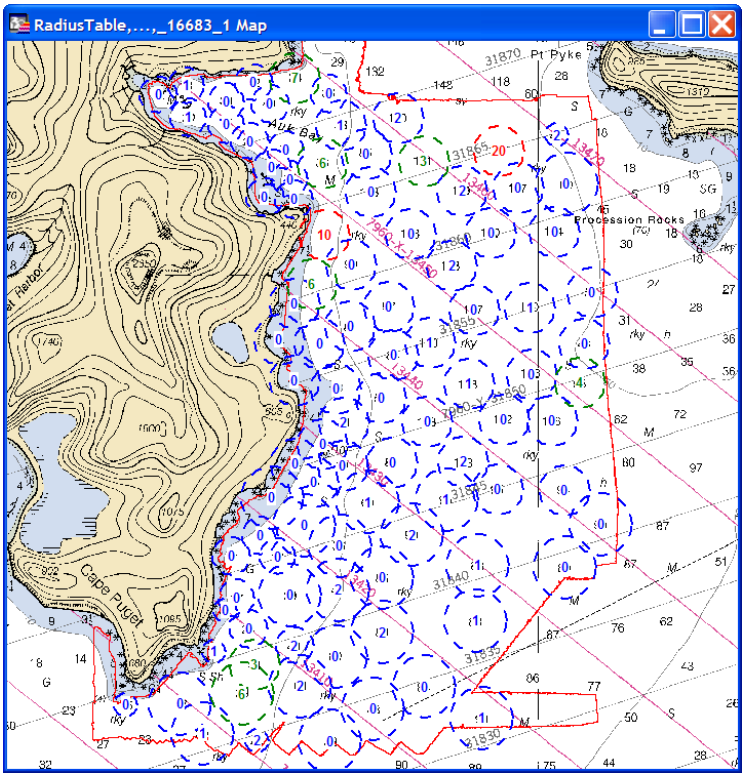


Figure 6. Chart Comparison: Differences > 10 fathom in red; > 2 fathom in green

Chart 16683

Most survey depths agreed within 1 -2 fathoms with depths on chart 16683. Differences vary from 1 – 20 fathoms.

Differences greater than 2 fathoms were found in deep water locations, generally in areas of high relief. Differences between survey and charted soundings may be attributed to localized mass wasting and uplifting caused by the 1964 earthquake.[10]

D.3 Shoreline

No shoreline data were acquired for this survey. Most of the survey area consists of exposed coastline subject to heavy surf. In general, the survey limits approximated the 8-meter depth curve and approached a 100-meter buffer distance from the MHW shoreline.[11]

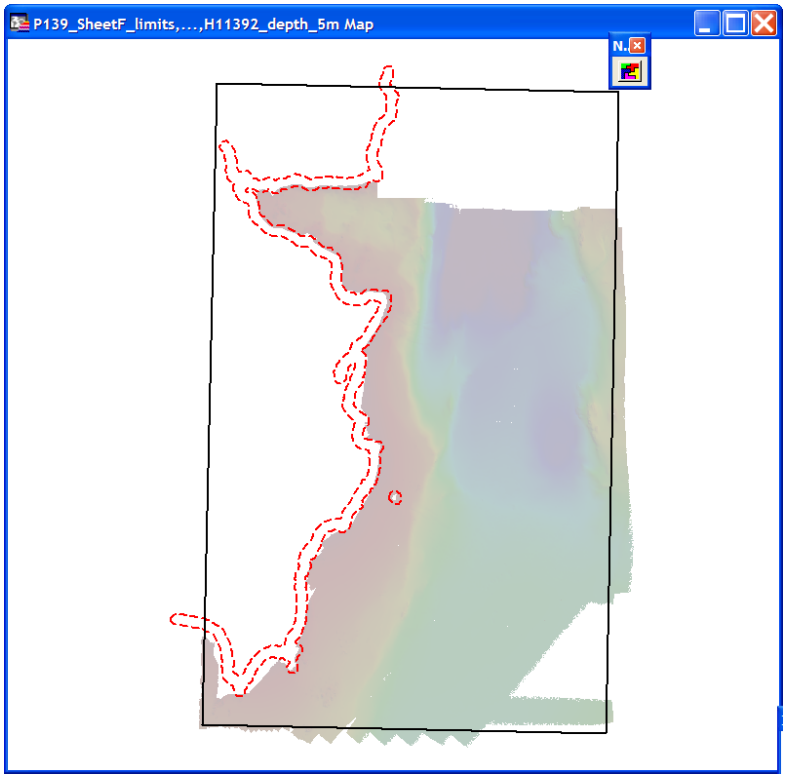


Figure 7. H11392 inshore limits

D.4 Dangers to Navigation and Shoals

D4.1 DTON

No dangers to navigation were observed or reported for this survey.[12]

D4.2 Shoals

No new navigationally significant shoals or features were observed during this survey.[13]

D.5 Aids to Navigation

No aids to navigation (ATONs) are located within the limits of H11392.[14]

D.6 Coast Pilot Information[15]

D.7 Miscellaneous

D.7.1 Bottom Samples

Three (3) bottom samples were collected within Auke Bay in accordance with the HSSDM and are attributed as SBDARE S-57 objects in the final Pydro PSS and XML data exchange sets.[16]

D.7.2 BASE Surface Deliverables

Caris BASE surfaces were generated at multiple resolutions to meet requirements specified in the HSD Field Procedures Manual Version 1 as of the most current release, April 1, 2005. 0.5, 1, 2, 5, and 10 meter resolution, unfinalized BASE surfaces are included with the submission field sheet for Branch review and product generation.[17]

D.7.3 Software Versions

The following list specifies what versions and updates of Pydro and CARIS were used during the processing of H11393 data.

PSS file created with Pydro version o 4.9.3

Data converted and processed with CARIS version 5.4, service pack 1 and hot fixes 12 - 21.

BASE surfaces created with CARIS version 5.4, service pack 1 and hot fix 21.

D.8 Statistics

Vessel	Survey day	Linear nmi	SVP	Bottom Samples
DA	266	31.75	5	N/A
DA	267	14.5	1	N/A
DA	279	24.46	3	N/A
DA	280	15.89	1	N/A
DA	288	1.05	0	N/A
DA	289	2.43	1	N/A
D2	281	21.66	4	N/A
D2	282	32.38	3	N/A
D2	283	2.1	0	N/A
R2	279	2.35	0	N/A
R2	280	2.49	2	N/A
R2	281	30.29	3	N/A
R2	282	28.14	3	N/A
R2	283	1.78	0	N/A
R2	295	10.68	2	3

Survey totals:

Survey days	Linear nmi	Square nmi	SVP	Bottom Samples
10	222	16.6	28	3

D.9 Adequacy of Survey

Summary and Recommendations for Additional Work

Survey H11392 is adequate to supersede charted soundings within the survey coverage and scope.[18]

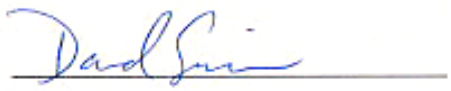
E. APPROVAL

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, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

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

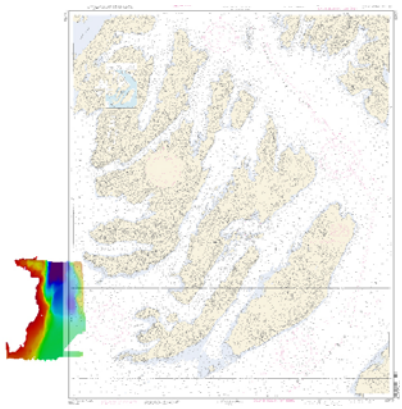
Title	Date Sent	Office
Data Acquisition and Processing Report for OPR-P139-TC-04	TBD	N/CS34
Horizontal and Vertical Control Report for OPR-P139-TC-04	TBD	N/CS34
Tides and Water Levels Package for OPR-P139-TC-04	12/04/04	N/OPS1
Coast Pilot Report for OPR-P139-TC-04	TBD	N/CS26

Approved and Forwarded: 

David A. Sinson
NOAA Physical Scientist
Lead Hydrographer

Revisions Compiled During Office Processing and Certification

[1] Filed with the project records.
[2] Crossline comparison comprised less than the 5% mandated in the Statement of Work, however, confidence in data quality is validated by the generally good agreement between mainscheme and crossline data.
[3] Replace "H11391" with "H11393".
[4] Eight soundings were designated for H11392. Of these, three were compiled to the HCell as SOUNDG and submerged UWTROC features.
[5] Concur
[6] Filed with the project records.
[7] Final approved water levels applied on 03/10/2006; Tide Note appended to this report.
[8] Concur
[9] During office processing chart comparison was also made to the larger scale chart 16702, 1:40,000, which covers the eastern 1,000 meters of the survey area. (See figure, below.)



Agreement between chart 16702 and survey depths are generally good, to within 5 meters in water depths of 30 to 250 meters. For both chart 16702 and 16683, there was little support for the numerous charted *rky* areas when compared to the highest available resolution BASE surfaces. Those *rky* areas that are charted in deeper water were removed from the HCell, and new rocky seabed areas were delineated, generally inshore of 20 meters.
[10] Differences may also be attributed to older positioning and surveying methods.
[11] Development of rocks, reefs and shoals between the 4 meter and 8 meter curve was required by the Standing and Letter Instructions, in part due to the origination of chart soundings from mid to early 1900's, and also due to the shoreline and nearshore changes resulting from the 1964 earthquake. A lack of low tide windows and heavy nearshore surf largely prevented fulfillment of this requirement.
[12] Concur
[13] Concur with clarification. Numerous nearshore submerged rocks and rocky seabed areas were identified during office processing using high resolution BASE surfaces.
[14] Concur. Use the latest ATONIS information.
[15] Coast Pilot 9, entry 780, for Auk Bay, indicates "…good anchorage in 20 fathoms, muddy bottom". Despite having delineated rocky areas near the anchorage for H11392, this statement remains an accurate characterization for Auk Bay.

[16] The three bottom samples collected for H11392 in and around Auk Bay, in addition to bottom characteristics from charts 16702 and 16683, have been included in the HCell.
[17] A finalized, combined 10m resolution BASE surface with approved tides, H11392_com_10m, was created in CARIS HIPS on May 7, 2007.
[18] Concur

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: April 25, 2005

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P139-TC-2004
HYDROGRAPHIC SHEET: H11392

LOCALITY: Port Bainbridge, Alaska
TIME PERIOD: September 22 - October 21, 2004

TIDE STATION USED: 945-4050 Cordova, Alaska
Lat. 60° 33.5'N Lon. 145° 45.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.559 meters

TIDE STATION USED: 945-5090 Seward, Alaska
Lat. 60° 07.2'N Lon. 149° 25.6'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.960 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: PWS1, PWS2 & CA145

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).

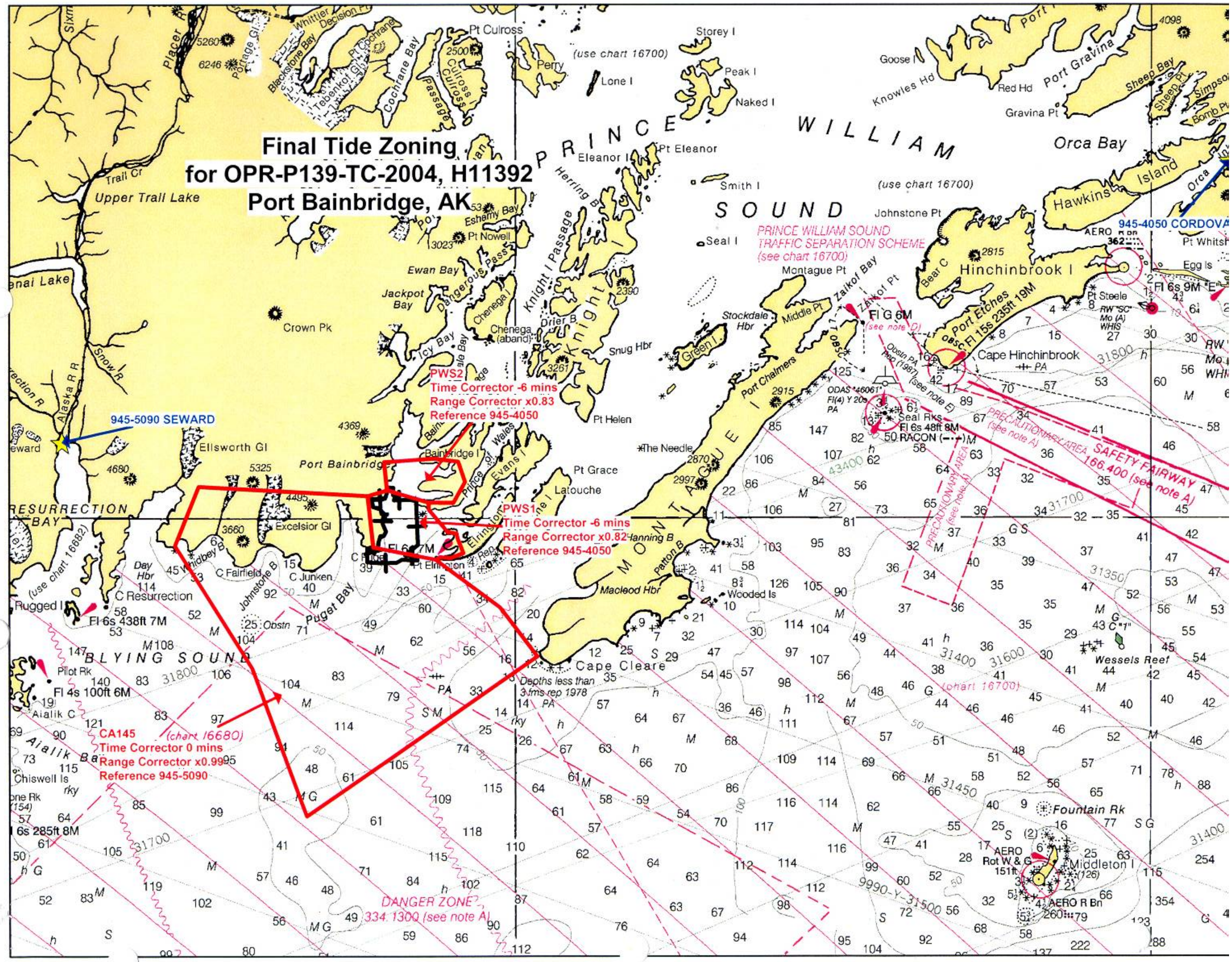
Thomas N. Gross 5/3/05

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-P139-TC-2004, H11392

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
Zone PWS1	945-4050	-6	0.82
-148.463554 60.035154			
-148.402947 60.043849			
-148.271815 60.024853			
-148.27125 60.013442			
-148.211626 59.97828			
-148.183105 59.976066			
-148.179621 59.968014			
-148.162288 59.945242			
-148.202462 59.937466			
-148.23717 59.938853			
-148.249602 59.93478			
-148.445818 59.954138			
-148.463554 60.035154			
Zone PWS2	945-4050	-6	0.83
-148.402947 60.043849			
-148.412469 60.088282			
-148.258525 60.093858			
-148.178861 60.089078			
-148.157324 60.05723			
-148.193595 60.024143			
-148.271815 60.024853			
-148.402947 60.043849			
Zone CA145	945-5090	0	0.99
-148.655827 59.530663			
-147.929815 59.782623			
-148.046435 59.859656			
-148.249602 59.93478			
-148.445818 59.954138			
-148.463554 60.035154			
-148.996033 60.050061			
-149.070356 59.957131			
-148.826452 59.763477			
-148.655827 59.530663			


Final Tide Zoning
for OPR-P139-TC-2004, H11392
Port Bainbridge, AK
PWS2
Time Corrector -6 mins
Range Corrector x0.83
Reference 945-4050
PWS1
Time Corrector -6 mins
Range Corrector x0.82
Reference 945-4050
CA145
Time Corrector 0 mins
Range Corrector x0.99
Reference 945-5090
945-5090 SEWARD
945-4050 CORDOVA
PRINCE WILLIAM SOUND
BLYING SOUND
RESURRECTION BAY
MONTAGUE I
Hinchinbrook I
PRINCE WILLIAM SOUND TRAFFIC SEPARATION SCHEME (see chart 16700)
SAFETY FAIRWAY 166.400 (see note A)
DANGER ZONE 334.1300 (see note A)

H11392 HCell Report

Cathleen Barry, Cartographer
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 H11392 utilized Office of Coast Survey HCell Specifications Version 2.0, April 2, 2007, with modifications as indicated in section 10.1, Data Processing Notes.

1. Compilation Scale

H11392 was compiled to chart 16702, 1:40,000. Soundings were compiled at two scales, emulating sounding density of the two charts coincident with the survey area: 16702, 1:40,000 and 16683, 1:81,436. (See *4. Meta Areas*.)

2. Soundings

2.1 Source Data

A 10 meter resolution Combined BASE surface, **H11392_Com_10m** was used as the basis for HCell production following Branch certification.

A survey-scale sounding (SOUNDG) feature object source layer was built from the Combined surface in CARIS BASE Editor. A shoal-biased selection was made at 1:10,000 scale using a radius table with values shown, below.

Upper limit (m)	Lower limit (m)	Radius (mm)
0	10	3
10	20	4
20	50	4.5
50	130	5
130	275	7

2.2 Sounding Feature Objects

In CARIS BASE Editor, using the surface and high density contours as a selection guide, chart density soundings were manually selected from the high density sounding hob layer, and placed into a new “chart scale” hob layer. Manual sounding selection was used rather than automated selection to better accomplish a density and distribution that more closely represents the seafloor morphology, and that emulates density and distribution of soundings on charts 16702 and 16683. See section 10.1, Data Processing Notes, for details about the use of manual sounding selection for H11392. The high density and chart density hob layers were imported into HOM where they were used and further refined during HCell compilation.

3. Depth Areas

3.1 Source Data

Using the Combined surface a single depth area was generated. No depth contours were delivered per OCS HCell Specifications ver.2.0.

3.2 Depth Area Feature Objects

One all-encompassing depth range, 0 meters to 280 meters, was used for all depth area objects below MLLW.

4. Meta Areas

The following Meta object areas are included in HCell 11730:

M_COVR
M_QUAL
M_CSCL

Meta area objects were constructed on the basis of a perimeter line delineating the surveyed limits. This perimeter was first used to create the Skin of The Earth (SOTE) layer, then was duplicated to the Meta object layers and attributed per the OCS HCell Specifications, ver. 2.0. The M_CSCL object is included to distinguish the area of soundings compiled to the smaller scale chart 16683. This new use for M_CSCL in HCells, and some other minor modifications to the HCell Specifications, are described in section 10.1, Data Processing Notes.

5. Survey Features

Three bottom samples were collected in the area of Auk Bay for H11392. In addition, all valid charted bottom samples within the surveyed area were imported into the HCell.

Numerous rocky seabed areas were delineated from the high resolution BASE surfaces. Only those submerged rocky areas found inshore of 20 meters, or beyond if they extended inshore, were delineated. Distinctive submerged rocks within these rocky areas, and elsewhere, were created as UWTROC feature objects.

Two charted anchorage areas were repositioned based on the presence of distinctive rocky seabed areas at their original charted locations.

Two charted islets and two charted exposed rocks were carried forward in the HCell.

6. Shoreline / Tide Delineation

No shoreline or intertidal areas are included in the HCell.

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. Some minor modifications to the attribution requirements stated in HCell Specifications, ver 2.0, have been made with approval from MCD. See section 10.1, Data Processing Notes, for details.

8. Layout

100: SS Soundings
101: Chart density soundings
200: Mega Depth Area
300: Rocks & Islets from ENC
301: Bottom Samples From Chart
302: Submerged Rocks from BASE Surface
303: New Anchorage areas from Surface
500: Rocky Seabed Areas from Surface
600: M_COVR
601: M_QUAL
602: M_CSCL
800: Blue Notes

8.2 Blue Notes

Notes regarding data sources are in CARIS HOM as layer 800, and as a Shapefile set, **H11392bluenotes_p** and **H11392bluenotes_l** (with the appropriate extensions).

9. Spatial Framework

9.1 Coordinate System

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

9.2 Horizontal and Vertical Units

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

A CARIS environment variable, **uslXsounding_round**, controls the depth at which rounding occurs. Setting this variable to NOAA fathoms and feet displays all soundings equal to or greater than 11 fathoms as whole units. Depths shoaler than 11 fathoms are shown in fathoms and feet.

In an ENC viewer fathoms and feet display in the format X**.**YZZZ, where X is fathoms, Y is feet, and ZZZ is decimals of the foot. For fathoms and feet between 0 and 10 fathoms 4.5 feet (10.75 fms), soundings round to the deeper foot if the decimals of the foot are X**.**Y75000 or greater. For fathoms and feet deeper or equal to 11 fathoms, soundings round to the deeper fathom if feet and decimals of the foot are X**.**45000 (X**.**Y75000) or greater. In an ENC viewer, heights greater than 6 feet will register in fathoms and feet using the above stated rules. Drying heights are in feet and are rounded using arithmetic methods.

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 (or fathoms and feet above 6 feet)
Positional Units (PUNI):	Meters

10. QA/QC

10.1 Data Processing Notes

Manual chart scale sounding selections were made for this survey. Experience has shown that in areas where bathymetry varied, automated sounding selection is impractical. None of the default sounding suppression options offered in CARIS BASE Editor or HOM yields an acceptable density and distribution of depths, generally bunching soundings nearshore with too sparse coverage seaward. While the customized options are more practical for this type of terrain, an inordinate amount of time must be spent in experimentation with variations on the algebraic terms in order to devise the most suitable formula, and manual adjustments are still required to the resulting sounding set.

Per agreement with MCD, and in anticipation of OCS HCell Specification ver 3.0, certain ver 2.0 requirement have been altered or not met. Deviations from the ver 2.0 Specifications are listed, below:

- M_NSYS: This meta area object has been eliminated from the HCell.

- SORIND: For the SORIND attribute, the term “surve” used for “source” was replaced with “survy” to indicate all surveyed features and meta objects.

- M_CSCL: The M_MSCL (Compilation Scale) meta area object was used to distinguish an area of soundings compiled to a smaller scale chart than the HCell compilation scale.

- TECSOU: A new specification for TECSOU requires use of ID number 1 - 14 for attributing M_QUAL area objects. All individual features within the HCell coverage area are attributed with TECSOU "0".

- Rocky Seabed Areas: New wording in the Specs allows for generalization of numerous discrete submerged rock features into rocky seabed areas at the discretion of the cartographer.

- The naming convention for the chart scale base cell file was changed from US511392_CU.000 to US511392_CS.000 to

10.2 ENC Validation Checks

H11392 was subjected to QA and Validation checks in HOM prior to exporting to the HCell base cell (000) file. Full millimeter precision was retained in the export of the metric S-57 base cell data set. This data set was converted to a chart unit 000 file. dKart Inspector 5.0 (Service Pack 1) was then used to further check the data set for conformity using the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and errors investigated and corrected where necessary.

11. Products

11.1 HSD, MCD and CGTP Deliverables

- H11392 Base Cell File, Chart Units, Soundings compiled to 1:40,000 and 1: 81,436
- H11392 Base Cell File, Chart Units, High density soundings
- H11392 Descriptive Report including end notes compiled during office processing and certification
- H11392 HCell Report
- Blue Notes shape files
- 000 Features File

11.2 File Naming Conventions

HOM file set prefix: *H11392_hc*

MCD Chart units base cell file: *US511730_CS.000*

MCD Chart units base cell file, survey scale soundings: *US511730_SS.000*

Features File (for CGTP): *H11392_Features.000*

11.3 Software

BASE Editor 2.1, SP 1:	Combination of Product Surfaces and initial creation of the S-57 bathymetry-derived features
HOM 3.3, SP 3:	Assembly of the HCell, S-57 products, QA
GIS 4.4a:	Setting the sounding rounding variable
dKart Inspector 5.0, SP 1:	Validation of the base cell file

12. Contacts

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

Cathleen Barry, Cartographer, PHB, Seattle, WA; 206-526-6841;
Cathleen.Barry@noaa.gov.

APPROVAL SHEET
H11392

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.

Cathleen Barry
cn=Cathleen Barry, c=US, o=NOAA, ou=Pacific Hydrographic Branch, email=Cathleen.Barry@noaa.gov
2008.04.11 11:03:18 -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: 2008.04.11 13:22:37 -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
2008.04.11 13:44:27 -07'00'

Rachel Soraruf

Digitally signed by Rachel Soraruf
DN: cn=Rachel Soraruf, c=US, o=NOAA/NOS/OCS/HSD, ou=Operations Branch, email=Rachel.Sorasuf@noaa.gov
Date: 2008.04.15 14:05:09 -04'00'