

H11687

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic Survey

Field No. N/A

Registry No. H11687

LOCALITY

State Alaska

General Locality Semidi Islands

Sublocality Chirikof Islands and Trinity Islands

2007

CHIEF OF PARTY

Commander Douglas D. Baird, NOAA

LIBRARY & ARCHIVES

DATE

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HYDROGRAPHIC TITLE SHEET		REGISTRY No H11687
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 <u>Alaska</u>		
General Locality <u>Semidi Islands</u>		
Sub-Locality <u>Chirikof Islands and Trinity Islands</u>		
Scale <u>1:135,000</u>		Date of Survey <u>May 25 to August 17, 2007</u>
Instructions dated <u>4/25/2007</u>		Project No. <u>S-P909-FA-07</u>
Vessel <u>NOAA Ship Fairweather (S220)</u>		
Chief of party <u>CDR Douglas D. Baird, NOAA</u>		
Surveyed by <u>ENS Llian Breen, CST Lynne Morgan, LT. Matthew Ringel</u>		
Soundings by <u>Reson 8111ER</u>		
SAR by <u>Fernando Ortiz</u>		Compilation by <u>Kurt Brown</u>
Soundings compiled in <u>Fathoms</u>		
REMARKS: <u>All times are UTC. UTM Zone 5 North</u>		
<u>The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS)</u>		
<u>naautical charts. All separates are filed with the hydrographic data. Revisions and end notes in red were</u>		
<u>generated during office processing. Page numbering may be interrupted or non sequential.</u>		

Descriptive Report to Accompany Hydrographic Survey H11687

Project S-P909-FA-07
Vicinity of Semidi Islands, AK
Offshore – Chirikof and Trinity Islands, AK
Scale 1:135,000
May – August, 2007
NOAA Ship FAIRWEATHER
Chief of Party: Commander Andrew L. Beaver, NOAA

A. AREA SURVEYED

The survey area was located in Offshore – Vicinity of Semidi Islands, AK. This survey corresponds to E in the sheet layout provided with the Project Instructions, as shown in *Figure 1* below. The survey area is bounded on the Southwest corner at 55°36'15"N, 156°17'31"W and the Northeast corner at 56°31'17"N, 155°09'37"W.

Data acquisition was conducted from May 25 to August 17, 2007 (DN 156 to DN 228).

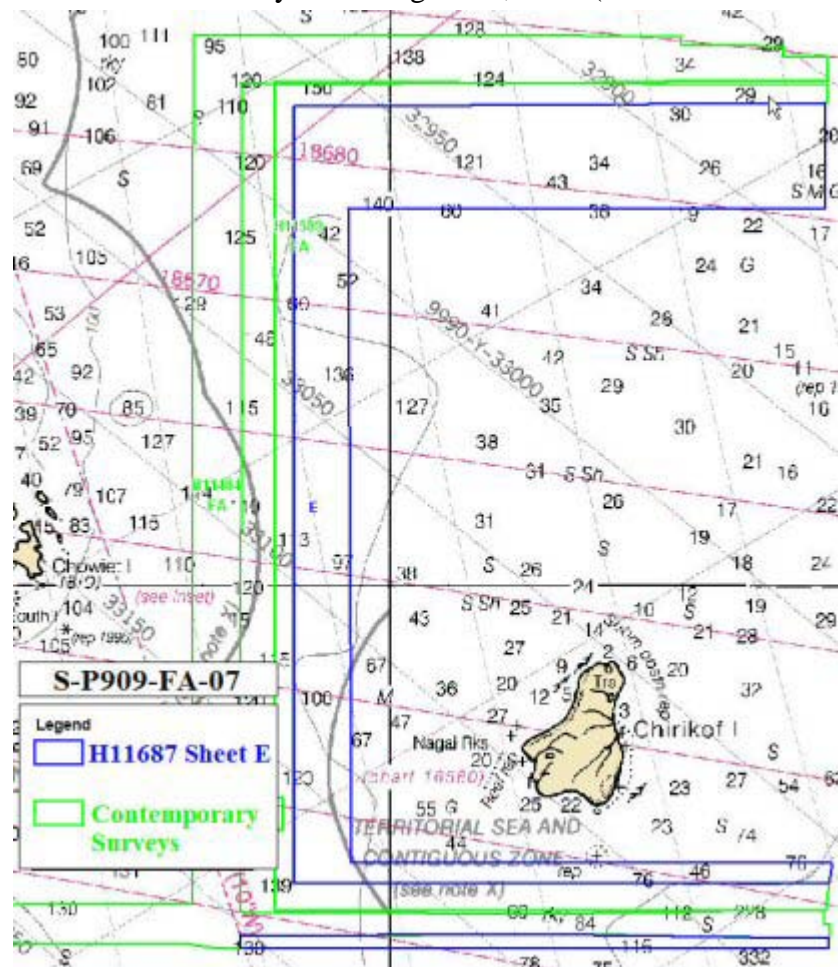


Figure 1: H11687

Multibeam echosounder (MBES) coverage was obtained on a “not to interfere with other projects” basis in the survey area at 1,000 meter line spacing not to exceed 800 meter holidays between swaths for depths greater than 100 meters and complete MB coverage for depths less than 100 meters.

MAIN SCHEME - Mileage	
Single Beam MS	0
Multibeam MS mileage	487.774279
SideScan MS	0
Total MS	487.774279
CROSSLINE - Mileage	
Single Beam XL	0
Multibeam XL	0
Total XL	0
OTHER	
Developments/AWOIS - Mileage	0
Shoreline/Nearshore Investigation - Mileage	0
Total # of Investigated Items	0
Total Bottom Samples	0
Total SNM	382.5
Specific Dates of Acquisition	June 5, 13, July 24, August 9, 10, 16 and 17 of 2007
Specific Dn#s of Acquisition	156, 164, 205, 221, 222, 228, 229

Table 1. Statistics for survey H11687

B. DATA ACQUISITION AND PROCESSING

A complete description of data acquisition/processing systems and survey vessels along with quality control procedures and data processing methods are included and described in the *S-P909-FA-07 Data Acquisition and Processing Report (DAPR)*¹, submitted with this survey. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections. This hydrographic survey was completed as specified by Hydrographic Survey Project Instructions S-P909-FA-07, dated April 25, 2007.

B1. Equipment and Vessels

Equipment and vessel used for data acquisition and survey operations during this survey is listed below in *Table 2*.

	FAIRWEATHER
Hull Registration Number	S220
Builder	Aerojet-General Shipyard
Length Overall	231 feet
Beam	42 feet
Draft, Maximum	15' 6"
Cruising Speed	12.5 knots
Max Survey Speed	10 knots
Primary Echosounder	RESON 8111
Sound Velocity Equipment	MVP 200
Attitude & Positioning Equipment	POS/MV V4
Type of operations	MBES

Table 2: Vessel Inventory

No vessel configurations used during data acquisition deviated from the *DAPR*.

B2. Quality Control

Internal consistency and integrity of data collected for survey H11687 were manually examined by the Hydrographer in CARIS subset mode. The internal consistency and integrity of data collected for survey H11687 were found to be adequate.²

Data quality for survey H11687 was evaluated through examination of CUBE and BASE surfaces that were generated from raw soundings. CUBE hypothesis count and strength were used to identify any areas of ambiguity where the surface model required manual review. All areas of high standard deviation were examined in raw soundings to eliminate noise and identify significant shoals. Soundings and surfaces in overlapping coverage and outer beams were reviewed for systematic errors and excessive noise. In general, the data were consistent in comparisons between day-day and line-line coverage with minor errors in water-level due to position limitations from the POS MV operating in course acquisition mode, sound-velocity errors, and holidays caused by system crashes.³

Crosslines

Multibeam echosounder crosslines were not collected for survey H11687.⁴

Junctions

Comparison to contemporary surveys that junction with survey H11687 was not required as stated in section 6.8 of the Project Instructions.

Quality Control Checks

MBES quality control checks were conducted as discussed in the quality control section of the DAPR.

Data Quality Factors

COVERAGE ASSESSMENT:

From the Project Instructions coverage must be complete multibeam coverage for depths less than 100 meters. For depths greater than 100 meters, however, up to 800 meter holidays may exist between swaths. The largest holiday between in H11687 is 852 meters, however there are also other holidays created through acquisition problems that are discussed below in the section “Unusual Conditions”.⁵

DESIGNATED SOUNDINGS:

Soundings were designated wherever the base surface did not capture the shoalest sounding. If a sounding in the vicinity of a rock or shoal was more than one half the IHO acceptable error away from the base surface then the sounding was designated. Upon finalizing the surface, the designated soundings were applied to the base surface; forcing the base surface to reach the shoalest sounding.

POSITIONING:

Data were collected with the POS MV in C/A mode. Horizontal accuracy parameters were monitored during acquisition of data and never exceeded 5.0 meters. On the first day, DGPS was attempted until the corrector signal from the Coast Guard base stations was lost. No noticeable horizontal data shifting effects caused by this interruption were found. For the remainder of the project the system was run in C/A mode.

SOUND VELOCITY:

Some characteristic “smiles” and “frowns” indicating incorrect sound speed correctors were seen in the data as illustrated in *Figure 2* and *Figure 3*. Sound velocity casts were taken every fifteen minutes, however in some locations sound velocity errors were still seen.⁶ A couple notable examples are shown below.

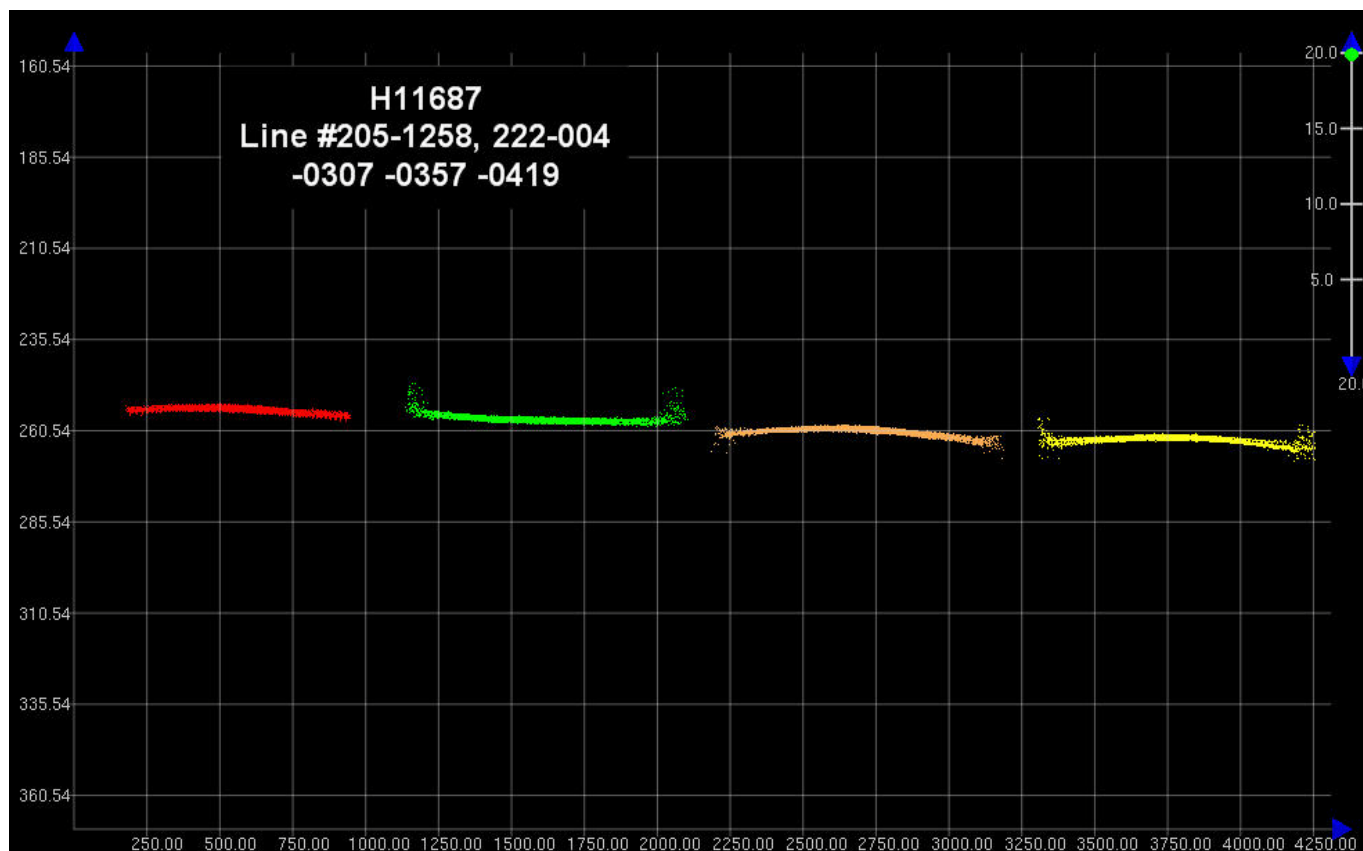


Figure 2: Shows sound velocity error within IHO order 2 after outer beams have been rejected.

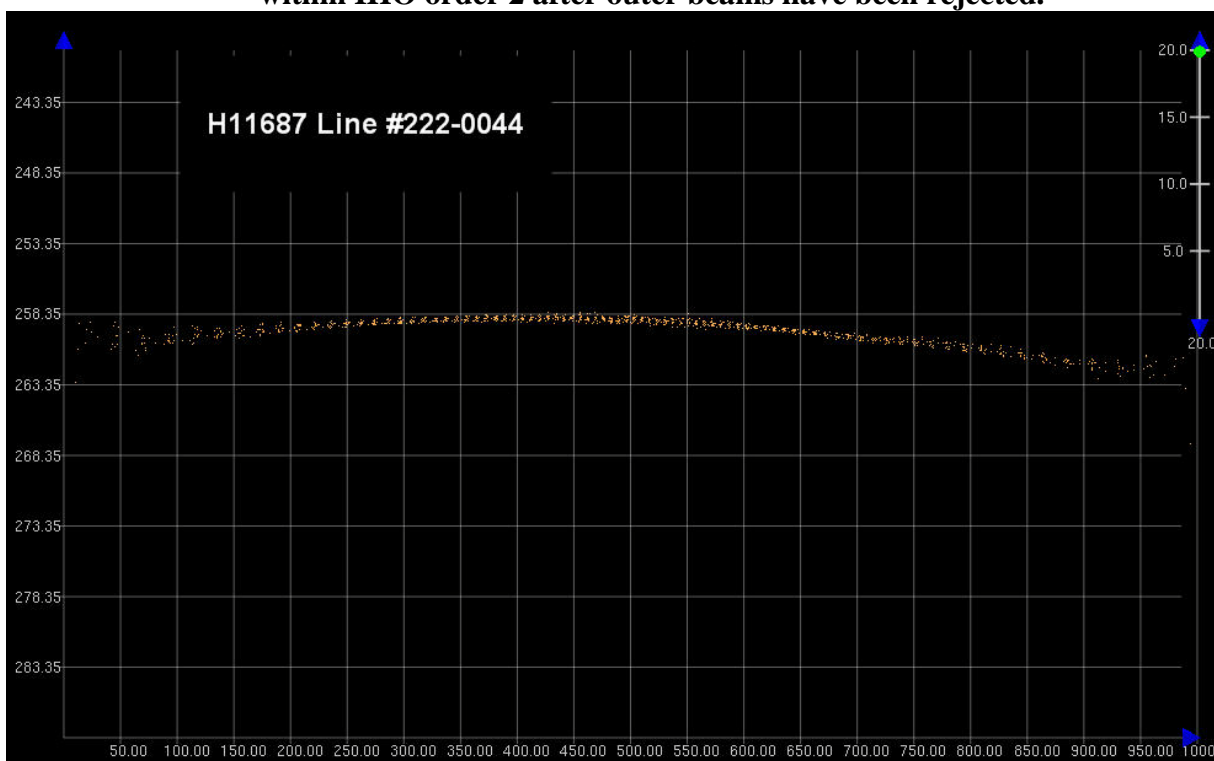


Figure 3: Sound Velocity displayed using one line with 20 times vertical exaggeration

OUTER BEAMS:

Holidays between lines were up to 800 meters as allowed for in the project instructions. Due to the nature of this survey there was little to no overlap between lines. The intrinsic error, noise, and spreading of the outer beams were cleaned by running a 65 degree filter on both port and starboard beams. Some lines required filtering to 62 degrees (listed Appendix IV) on the port and starboard beams. Beyond that all the data was further manually cleaned using CARIS HIPS and SIPS as discussed in the DAPR.

Lines from DN 221, DN 228, and DN 229 display a vertical shift from one day to the next. This separation was most noticeable in places where data from adjacent lines overlap even after cleaning. This separation is likely due to sound velocity errors as the affected lines exhibit a small degree of characteristic “smiles” and “frowns”. The largest divergence found was 5 meters at a depth of 213 meters in lines 221-1824 and the adjacent line 228-2209 as displayed in the *figure 4*.

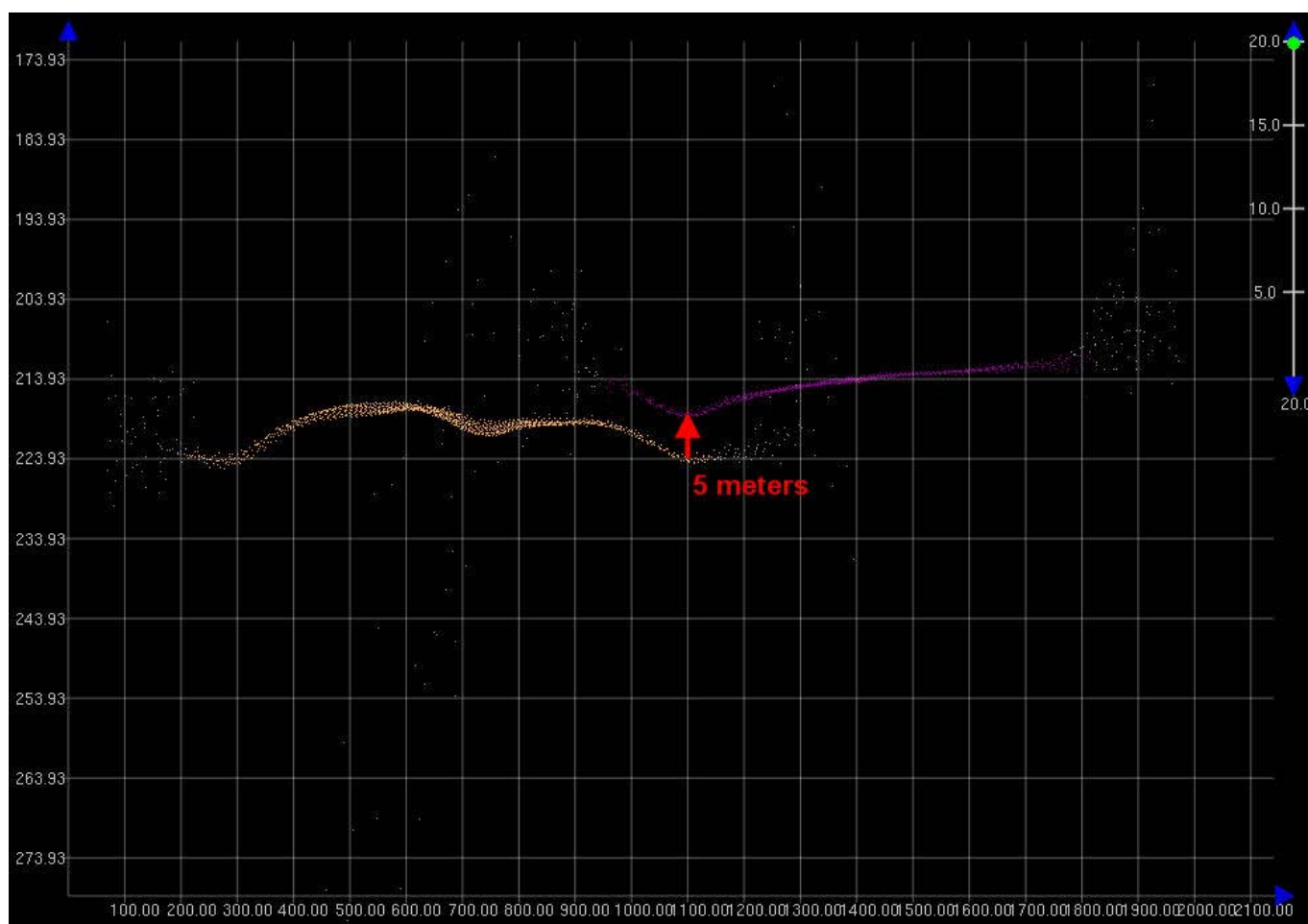


Figure 4: Vertical Data shift between lines 221-1824 and 228-2209. All units are in meters.

UNUSUAL CONDITIONS

Many holidays were caused by crashes in the Isis System as shown in *figure 5*, and data collected past 0000 GMT as shown in *figure 6* and *figure 7*. Since this project was run on a “not to interfere” basis, the ship did not attempt to fill in these holidays. The largest of the holidays was 1400 meters by 5000 meters, however, in all cases none of the surrounding data showed signs of shoaling.⁷

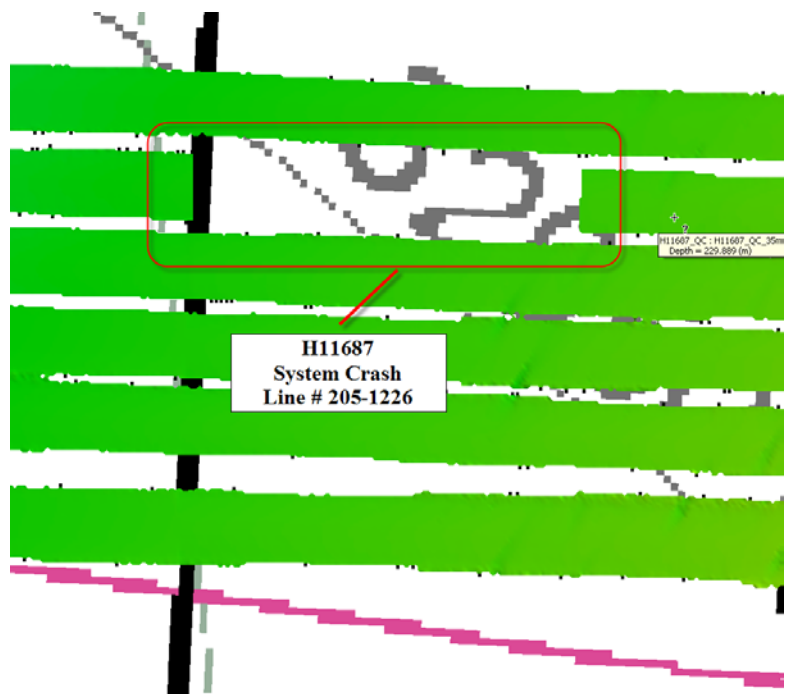


Figure 5: Holiday created during a system crash.

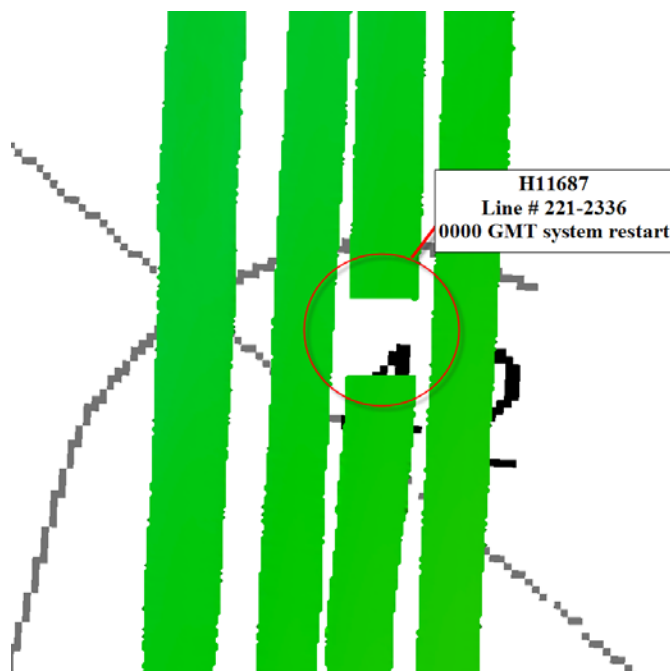


Figure 6: Holiday created during a system restart after crossing 0000 GMT.

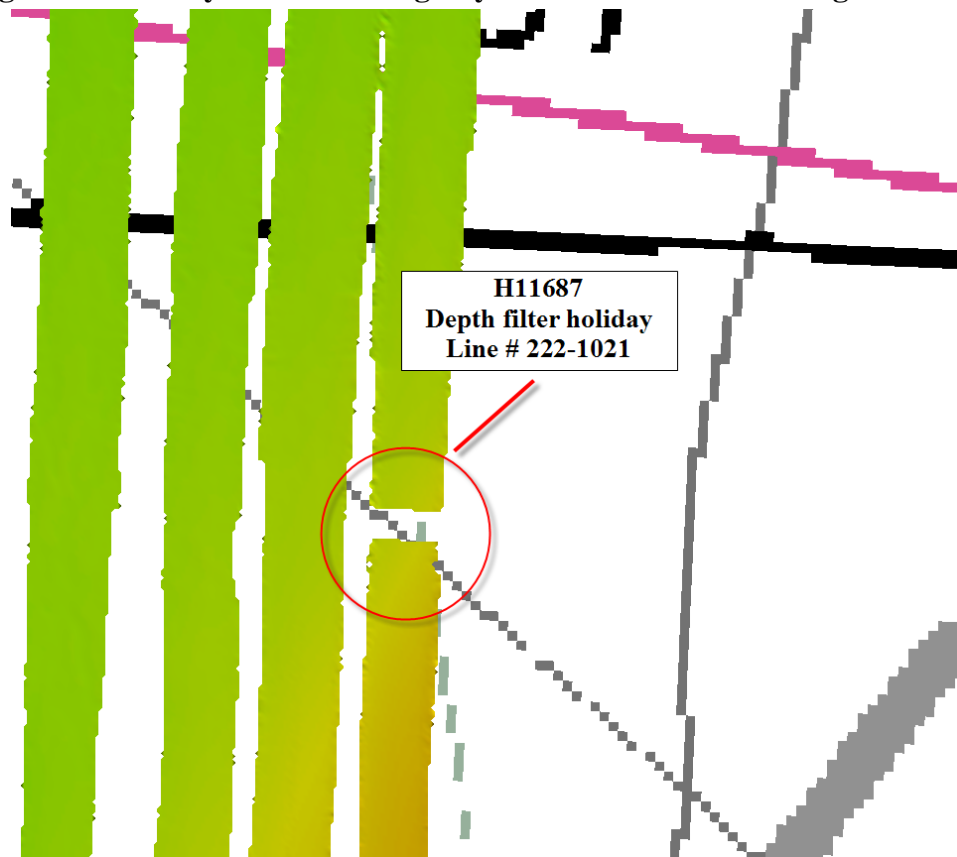


Figure 7: Holiday

Accuracy Standards

All data were acquired and cleaned to meet either IHO order 1 or IHO order 2 level of acceptable error. Most of the data displays spreading that is less than the IHO order of acceptable error for the respective depth, but some areas such as the tidal separation discussed above only barely meet IHO order 2 in depths greater than 100 meters. All data that did not meet either IHO order 1 in depths less than 100 meters or IHO order 2 in depths greater than 100 meters were rejected.⁸

B3. Corrections to Echo Soundings

Data reduction procedures for survey H11687 conform to those detailed in the DAPR.

B4. Data Processing

There was 1 field sheet used to fill the resolution requirements for survey H11687. Field sheet H11687 is the only fieldsheet, encompassing the entire survey area with the sixteen-meter resolution Cube surface. The cube surface parameters used to produce the surface is shown in *figure 8*. The field sheet areas of coverage are displayed in *figure 9*.

Advanced Options [?] [X]

Template file: IPS\61\Template\CUBEParams.xml ...

Configuration: 16MeterGrid

Comment: This is a test parameter used to determine CUBE behavior using a 16 Meter grid resolution.

Surface Creation

Estimate Offset: 4.00

Capture Distance Scale: 1.00 %

Capture Distance Minimum: 11.31 m

Horizontal Error Scalar: 2.95

Disambiguation

Density Strength Limit: 2.00

Locale Strength Maximum: 2.50

Locale Search Radius: 1 pixels

☐ Null Hypothesis Test

Minimum Number of Neighbours: 5

Standard Deviation Ratio: 2.00

Neighbour Strength Maximum: 2.50

OK Cancel

Figure 8: The Cube surface parameters used in CARIS Hips and SIPS when producing each of the surfaces.

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 Sand Point, AK (945-9450) and Alitak, AK (945-7804) served as control for datum determination and as the primary source for water level reducers for survey H11687 during acquisition.

A request for delivery of final approved water level data (smooth tides) for Survey H11687 was forwarded to N/OPS1 on August 23, 2007 in accordance with the *Field Procedures Manual*, dated March 2007 (FPM). A copy of the request is included in Appendix V.

FAIRWEATHER received the Tide Note for Hydrographic Survey H11687 on August 30, 2007. The Tide Note for Hydrographic Survey H11687 states that preliminary zoning is accepted as the final zoning correctors. Final approved water level data were received by the FAIRWEATHER on November 12, 2007 for NWLON primary tide station Alitak (945-7804). The Tide Note for Hydrographic Survey H11687 and ancillary correspondence are included in Appendix IV.¹⁰

As per the Project Instructions, all data were reduced to MLLW using the final approved water levels (smooth tides) from station Alitak (945-7804) by applying tide file 9457804.tid and time and height correctors through the zone corrector file P909FA2007CORP.zdf., on November 15, 2007.

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

Chart comparison procedures were followed as outlined in the DAPR.

Survey H11687 was compared with charts 16587 (1st Ed.; August 01, 2006, 1:80,000), 16580 (13th Ed.; January 1, 2005, 1:350,000), and 16013 (29th Ed.; November 01, 2003). Chart 16587 has been updated with the Notice to Mariners through September 09, 2006 and with the Local Notice to Mariners through September 05, 2006. The most recent Local Notice to Mariners from July 21, 2008 was also consulted for chart 16587. Chart 16580 has been updated with the Notice to Mariners through January 08, 2005 and the Local Notice to Mariners through December 28, 2004. The most recent Local Notice to Mariners from July 21, 2008 was also consulted for chart 16580. Chart 16013 has been updated with the Notice to Mariners through November 22, 2003 and with the Local Notice to Mariners through November 11, 2003. The most recent Local Notice to Mariners Updates as of July 21, 2008 was also consulted for chart 16013. There were no new changes within the survey area.

Chart 16587

Many of the soundings on chart 16587, particularly in the northeast, northwest, and southwest sections of the survey, are not representative of the surveyed depths in the surrounding area (see *Figure 10, 11, 12, and 13*).¹¹ *Figures 10 and 12* show the northwest corner and the southwest corner of the survey. They

compare the charted contour lines to the contour lines produced by the 16 meter cube surface from CARIS.

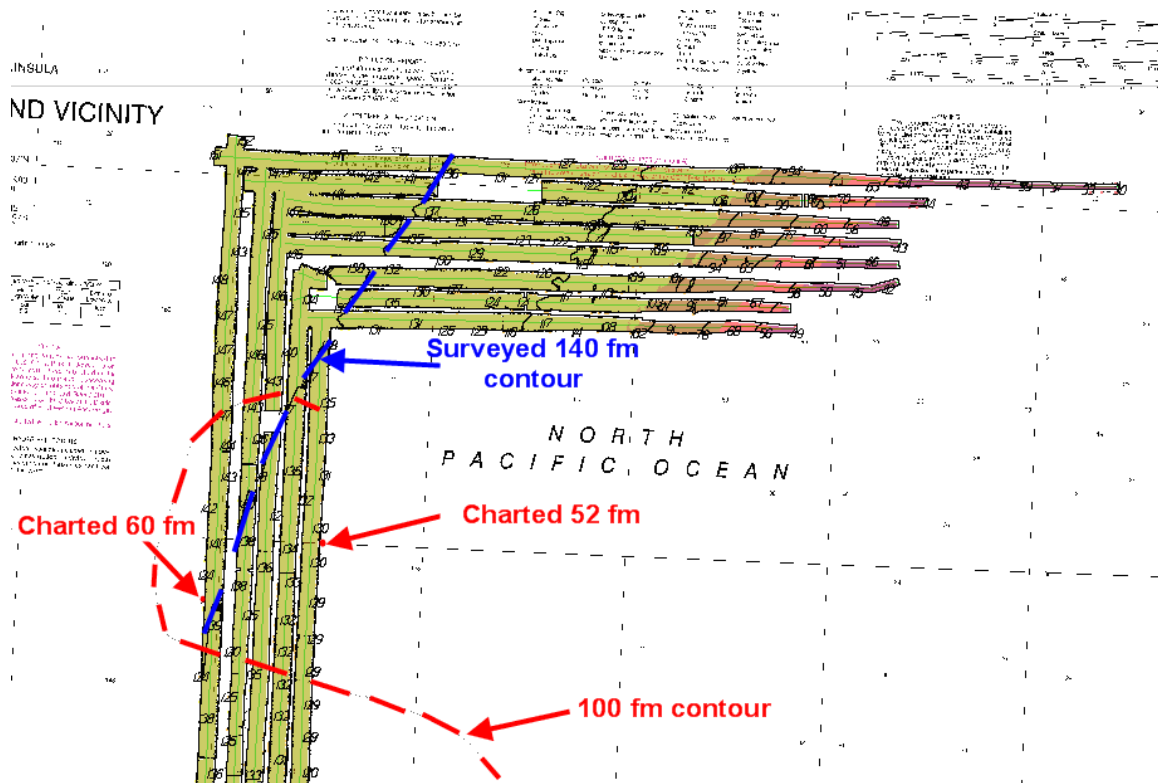


Figure 10. The red line is the 100 fm contour from Chart 16587, and the blue line shows the 140 fm contour produced by this survey crossing through the charted 100 fm contour.

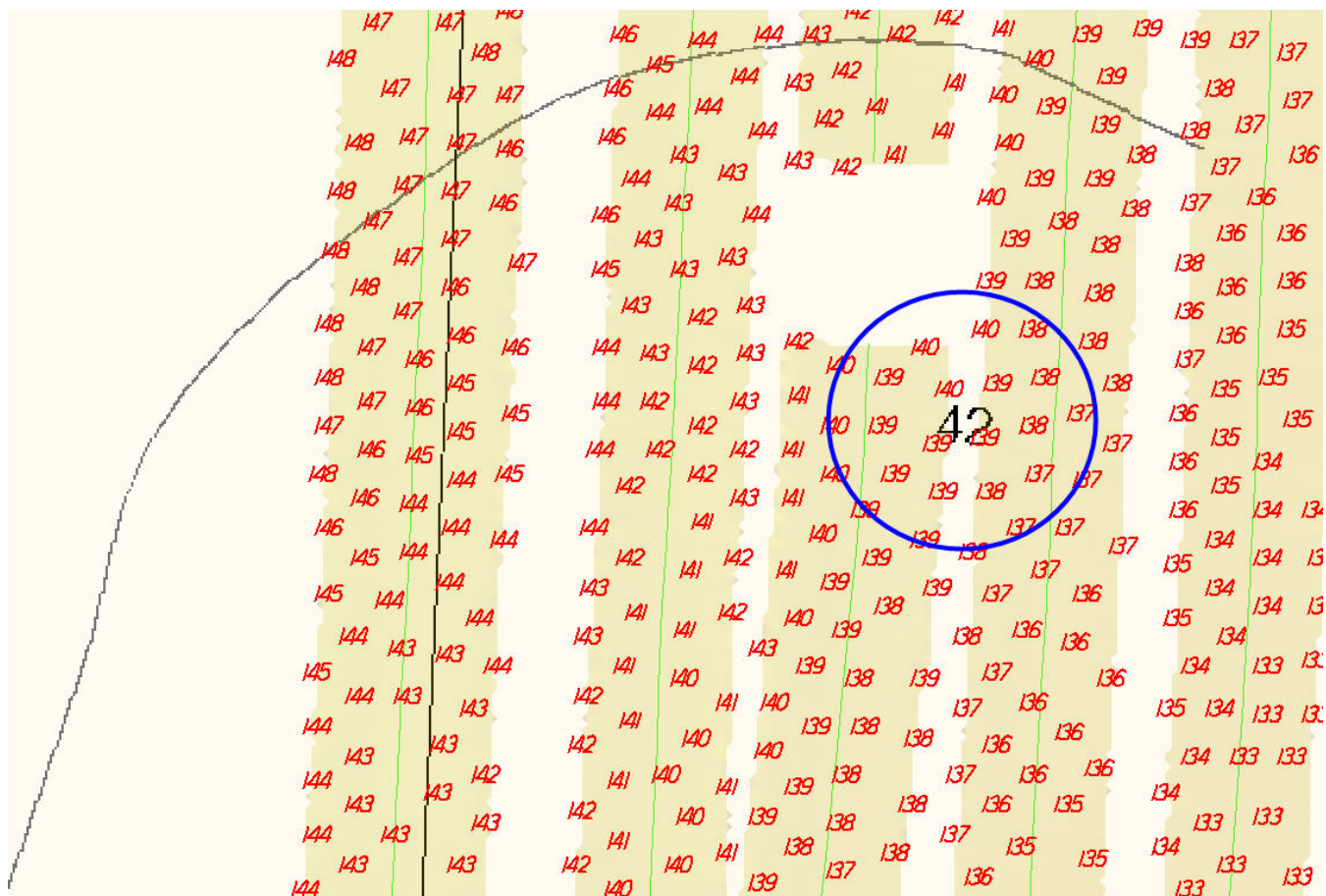


Figure 11. Charted (16587) sounding in the northwest corner of the survey area does not agree with the depths acquired in this survey. All units are in fathoms.

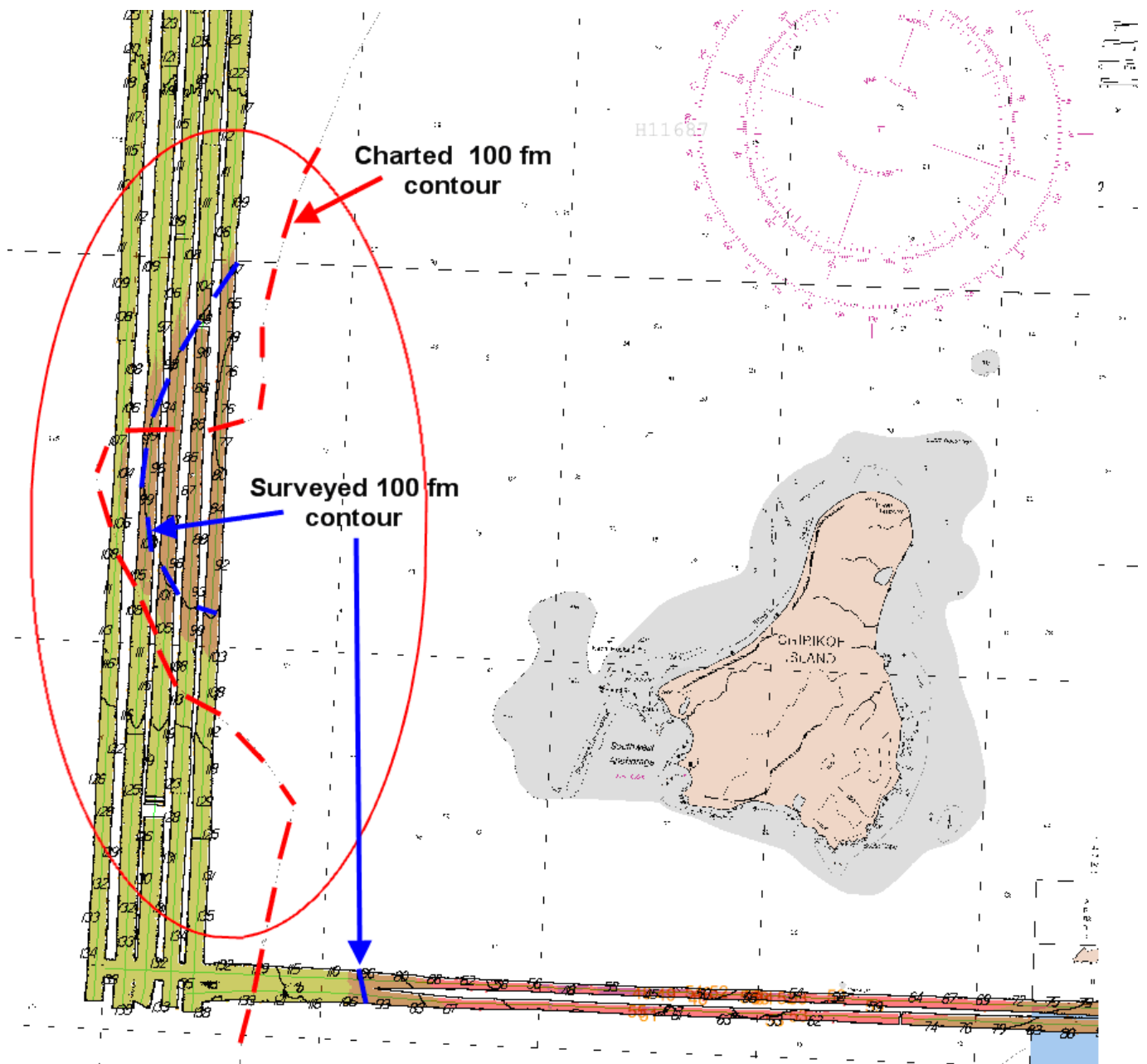


Figure 12. The red line is the 100 fm contour from Chart 16587, and the blue line shows the 100 fm contour line produced by this survey.

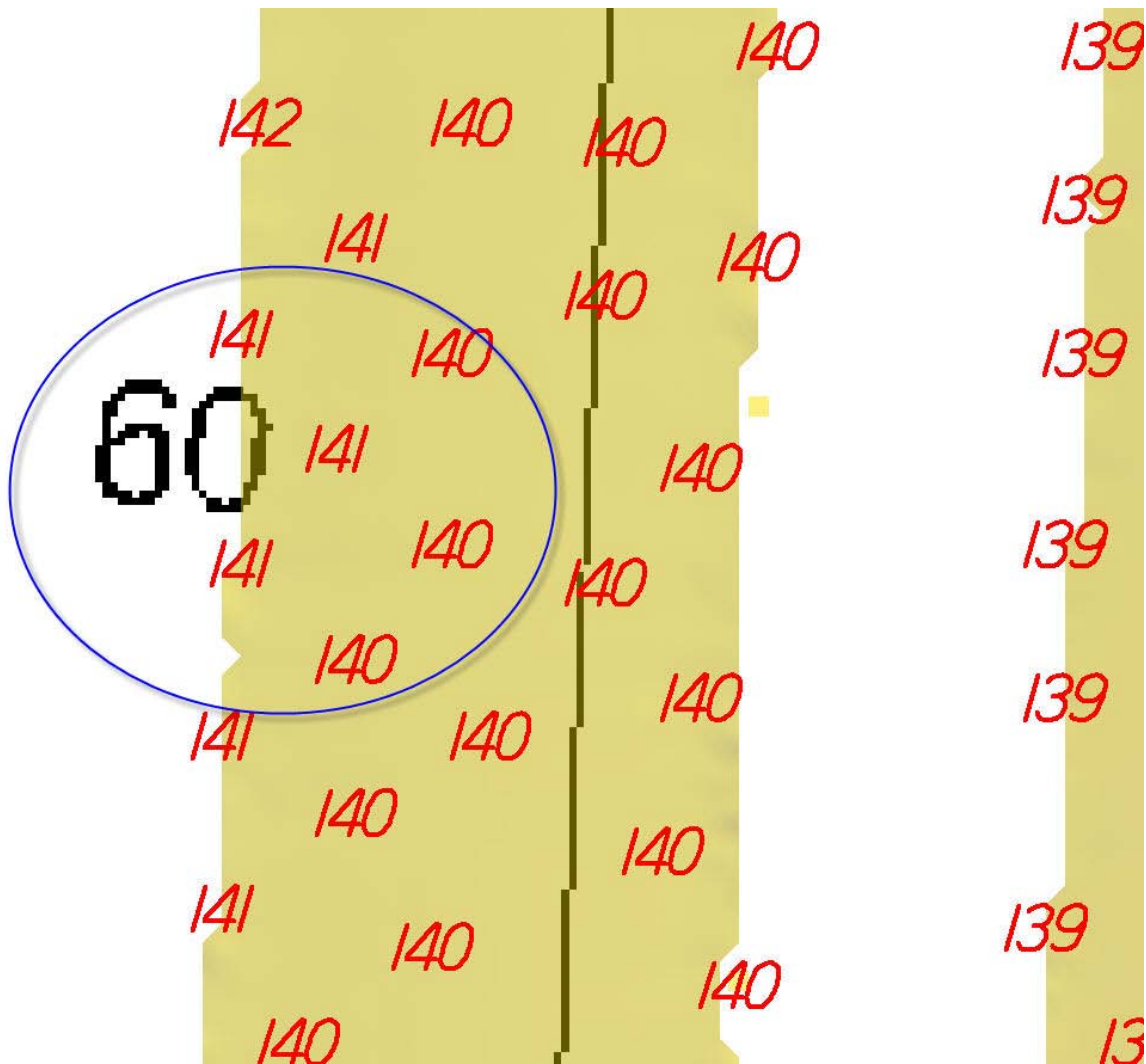


Chart 16580

Many of the soundings on chart 16587, particularly in the southwest of the survey, are not representative of the surveyed depths in the surrounding area (see *figure 14*). Here, as in general throughout this sheet, the charted are all shoaler than the acquired data from H11687, however some of charted soundings differ greatly, such as the 46 fm just below the surveyed 94 fm or the charted 76 fm next to the 180 fm surveyed.¹² The north end of H11687 agrees closer with chart 16580 as all soundings are within 10% as shown in *figure 15*.

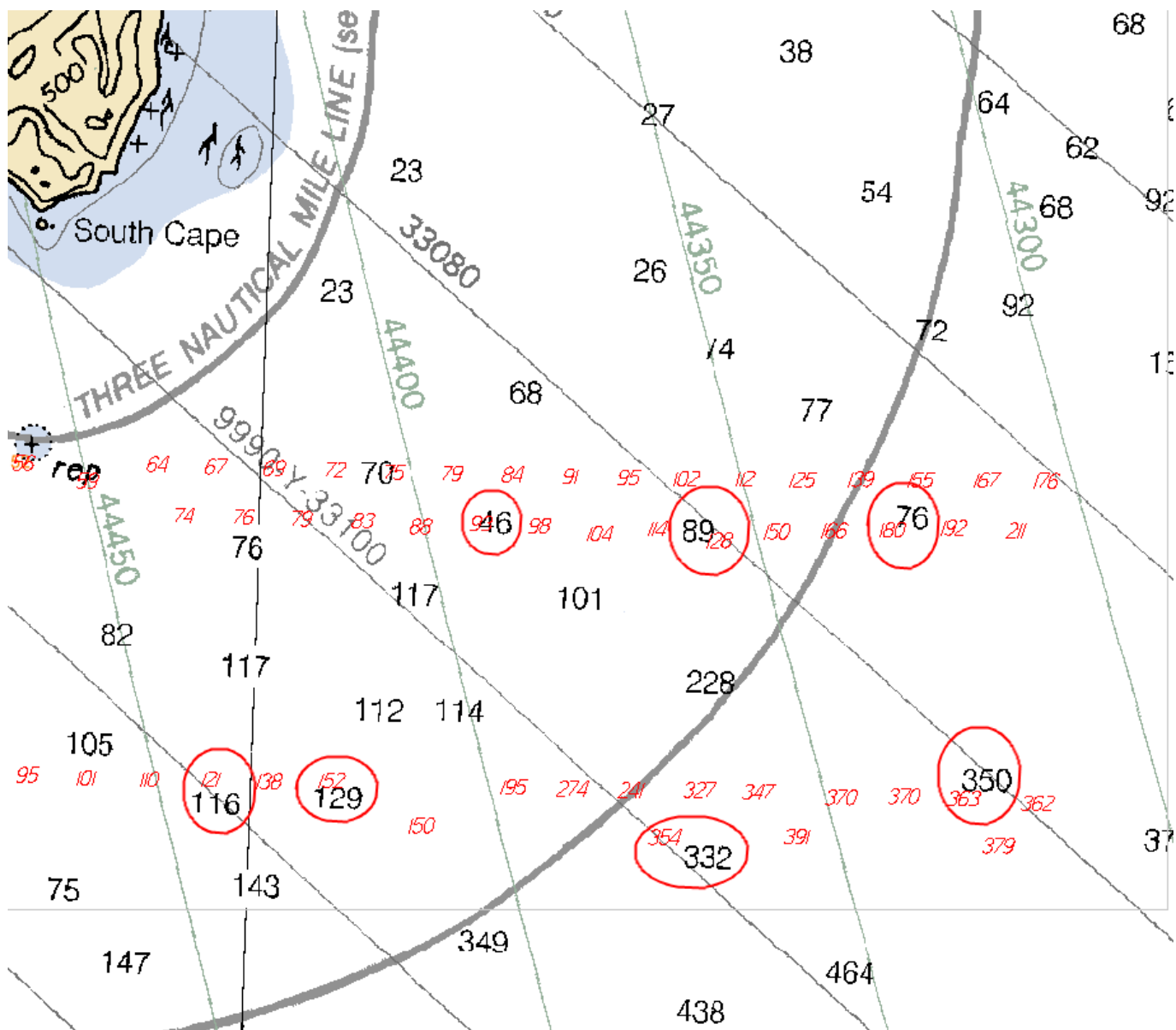


Figure 14. Charted (16580) soundings on the southeast corner of the survey area do not agree with the depths acquired in this survey. All units are in fathoms.

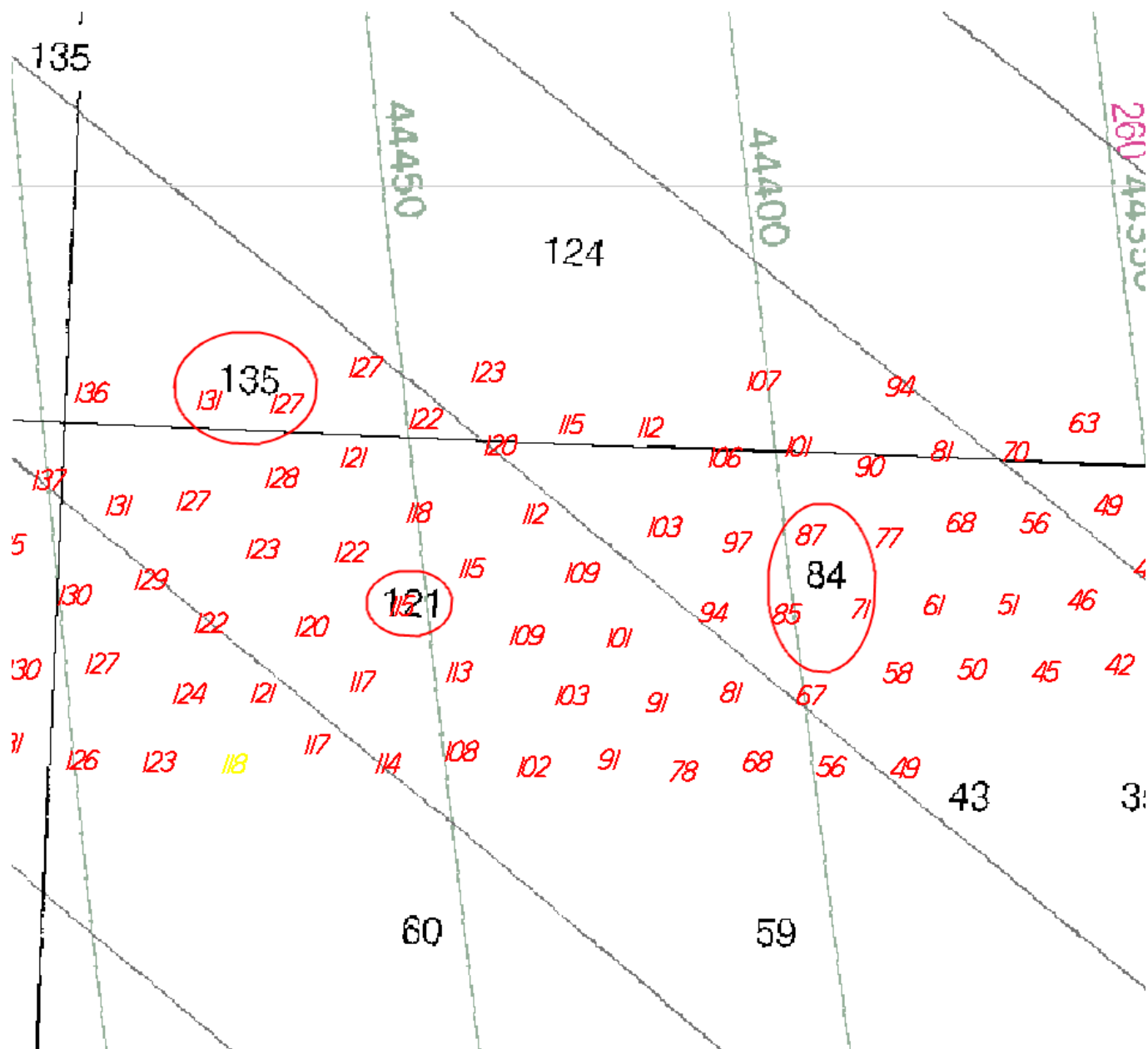


Figure 15. Charted (16580) soundings at the north end of the survey area agree within 10% with the soundings acquired in this survey. All units are in fathoms.

Chart 16013

Chart 16013 displayed the same disagreements in contour lines and soundings with the surveyed data from H11687 as is discussed above for the two larger scale charts.¹³

Chart Comparison Recommendations

The Hydrographer has determined that bottom coverage requirements have been met and data accuracy meets requirements specified by the *HSSDM*. **The surveyed soundings are adequate to supersede prior**

surveys in their common areas.¹⁴ Based on the application of verified water level data (smooth tides) by FAIRWEATHER, final chart comparisons are not required by the Pacific Hydrographic Branch.

Automated Wreck and Obstruction Information System (AWOIS) Investigations

There were no AWOIS items located within the limits of H11687.¹⁵

Dangers to Navigation

| There were no dangers to navigation found within the survey limits.¹⁶

D.2 Additional Results

Shoreline Verification and Processing

There was no shoreline verification required within the survey limits.¹⁷

Aids to Navigation

There were no Aids to Navigation found within the survey limits.¹⁸

Bottom Samples

No bottom samples were collected for survey H11687.¹⁹

E. Supplemental Reports

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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Hydrographic Systems Readiness Review Memo 2007	April 23, 2007	N/CS34
S-P909-FA-07 Data Acquisition and Processing Report	Under Same Cover	N/CS34
S-P909-FA-07 Horizontal & Vertical Control Report	August 22, 2007	N/CS34, N/OPS1
S-P909-FA-07 Tides and Water Levels Package	N/A	N/OPS1
S-P909-FA-07 Coast Pilot Report	N/A	N/CS26



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
NOAA Ship FAIRWEATHER S-220
1010 Stedman Street
Ketchikan, AK 99901

August 6, 2008

MEMORANDUM FOR: CDR David Neander, NOAA
Chief, Pacific Hydrographic Branch

FROM: CDR Douglas D. Baird, JR., NOAA
Commanding Officer

TITLE: Approval of Hydrographic Survey H11687,
S-P909-FA

Digitally signed by Doug Baird
DN: cn=Doug Baird, o=NOAA Ship FAIRWEATHER,
ou=NOAA, email=co.fairweather@noaa.gov, c=US
Reason: I am approving this document
Date: 2008.08.07 08:56:47 -08'00'

As Chief of Party, I have ensured that standard field surveying and processing procedures were adhered to during acquisition and processing of hydrographic survey H11687 in accordance with the Hydrographic Manual, Fourth Edition; Hydrographic Survey Guidelines; Field Procedures Manual, Mar 2007; and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for April 2007. Additional guidance was provided by applicable Hydrographic Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required. All data and reports are respectfully submitted to N/CS34, Pacific Hydrographic Branch.

I acknowledge that all of the information contained in this report is complete and accurate to the best of my knowledge.

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

Llian Breen

Digitally signed by Llian Breen
DN: cn=Llian Breen, c=US, o=NOAA,
ou=Fairweather, email=llian.breen@noaa.gov
Reason: I attest to the accuracy and integrity of this
document
Date: 2008.08.07 16:23:12 Z

ENS Llian Breen
Survey Manager

Matthew Ringel
2008.08.06 22:10:25 Z

LT Matthew Ringel
Field Operations Officer

CST Lynn Morgan
Chief Survey Technician



Revisions Compiled During Office Processing and Certification

¹ Filed with project records

² Concur

³ Several data fliers affecting the 16m BASE surface beyond IHO Order 2 were found throughout the survey and were cleaned by the reviewer.

⁴ Crosslines were not required for survey H11687.

⁵ Concur.

⁶ Sound velocity errors were noted in the 16m BASE surface during the SAR and the reviewer provided additional cleaning of data that were affecting the BASE surface.

⁷ The holidays are shown in the HCell M_QUAL layer.

⁸ Concur

⁹ Filed with Hydrographic records

¹⁰ Concur. See attached Tide Note dated August 30, 2007.

¹¹ Concur with clarification. Full coverage was not obtained over the 42 fathom and 60 fathom charted soundings shown in figures 11 and 12. In the case of the 42 fathom sounding, there is also a large data gap (due to a system restart) directly to the north. Due to the large difference in the value of the charted soundings and depths from the survey, and the possibility that the source of these soundings are seamounts in the unsurveyed areas, the compiler recommends retaining the charted soundings. A complete survey of the soundings and surrounding areas is recommended during future transits.

¹² Concur with clarification. Full coverage was not obtained over the 46 fathom and 89 fathom soundings shown in figure 14. The compiler recommends retaining these soundings as charted.

¹³ Concur

¹⁴ Concur with clarification. Chart data as shown in HCell H11687.

¹⁵ Concur

¹⁶ Concur

¹⁷ Concur

¹⁸ Concur

¹⁹ Retain all charted bottom types.



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : Aug 30, 2007

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: S-P909-FA-2007
HYDROGRAPHIC SHEET: H11687

LOCALITY: Offshore - Chirikof and Trinity Islands, AK
TIME PERIOD: June 5 - August 17, 2007

TIDE STATION USED: 945-7804 Alitak, AK
Lat. 56° 53.8'N Long. 154° 14.9' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.300 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SWA147, SWA148, SWA149, SWA150, SWA151,
SWA152, SWA153, SWA170, SS99, SS100,
SS101, SS104 & SS105

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).

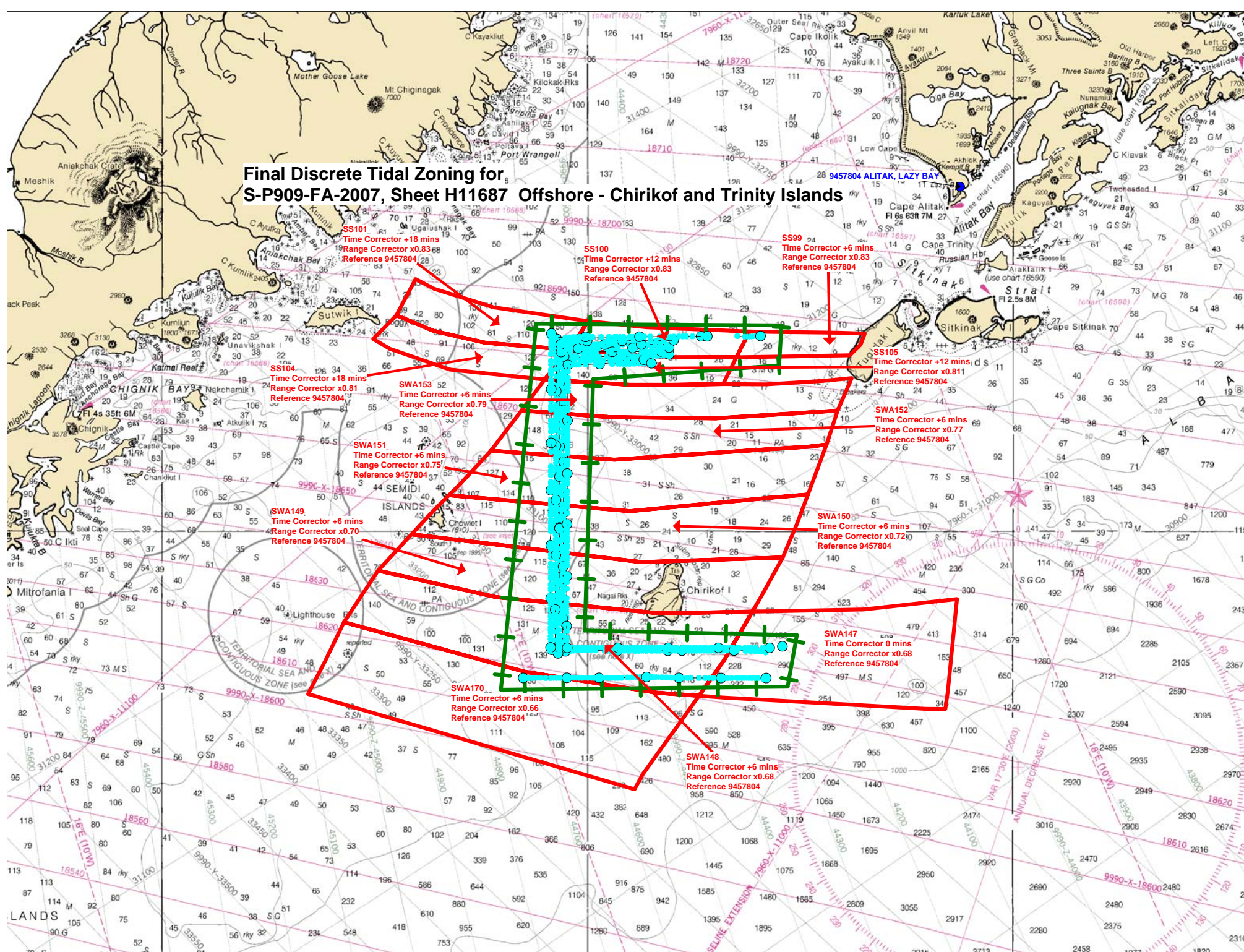
Peter J. Stone

CHIEF, PRODUCTS AND SERVICES DIVISION

Digitally signed by Peter J. Stone
DN: cn=Peter J. Stone, o=NOAA/NOS/CO-OPS, ou=Oceanographic Division,
email=peter.stone@noaa.gov, c=US
Date: 2010.08.17 13:45:45 -0400



**Final Discrete Tidal Zoning for
S-P909-FA-2007, Sheet H11687 Offshore - Chirikof and Trinity Islands**



H11687 HCell Report
Kurt Brown, Physical Scientist
Pacific Hydrographic Branch

1. Specifications, Standards and Guidance Used in HCell Compilation

HCell compilation of survey H11687 used:

Office of Coast Survey HCell Specifications: Draft, Version: 4.0, 17 March, 2010.
HCell Reference Guide: Version 2.0, 22 February, 2010.

2. Compilation Scale

Depths and features for HCell H11687 were compiled to the largest scale raster charts shown below:

Chart	Scale	Edition	Edition Date	NTM Date
16580	1:350,000	14th	06/12/2010	01/01/2008
16013	1:969,761	30th	10/12/2010	07/01/2006

The following ENC's were also used during compilation:

Chart	Scale
US3AK5KM	1:350,000
US1WC02M	1:2,100,000

3. Soundings

A survey-scale sounding (SOUNDG) feature object layer was built from the 12-meter Combined Surface in CARIS BASE Editor. A shoal-biased selection was made at 1: 50,000 survey scale using a single defined radius value of 5 meters.

In CARIS BASE Editor soundings were manually selected from the high density sounding layers (SS) and imported into a new layer (CS) created to accommodate chart density depths. Manual selection was used to accomplish a density and distribution that closely represents the seafloor morphology.

4. Depth Contours

Depth contours at the intervals on the largest scale chart are included in the *_SS HCell for MCD raster charting division to use for guidance in creating chart contours. The metric and fathom equivalent contour values are shown in the table below.

Chart Contour Intervals in Fathoms from Chart 16580	Metric Equivalent to Chart Fathoms, Arithmetically Rounded	Metric Equivalent of Chart Fathoms, with NOAA Rounding Applied	Fathoms with NOAA Rounding Applied	Fathoms with NOAA Rounding Removed for Display on H11687_SS.000
50	91.44	92.812	50.750	50
100	182.88	184.252	100.750	100

5. Meta Areas

The following Meta object areas are included in HCell H11687:

M_QUAL
M_CSCL

The Meta area objects were constructed on the basis of the limits of the hydrography.

6. Features

No features are included in the HCell.

7. S-57 Objects and Attributes

The *_CS HCell contains the following Objects:

\$CSYMB	Blue Notes-Notes to the MCD chart Compiler
M_CSCL	Compilation scale Meta area for raster 16013
M_QUAL	Data quality Meta object
SOUNDG	Soundings at the chart scale density

The *_SS HCell contains the following Objects:

DEPCNT	Generalized contours at chart scale intervals
SOUNDG	Soundings at the survey scale density

8. Spatial Framework

8.1 Coordinate System

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

8.2 Horizontal and Vertical Units

DUNI, HUNI and PUNI are used to define units for depth, height and horizontal position in the chart units HCell, as shown below.

Chart Unit Base Cell Units:

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

During creation of the HCell in CARIS BASE Editor and CARIS S-57 Composer, all soundings and features are maintained in metric units with as high precision as possible. Depth units for soundings measured with sonar maintain millimeter precision. Depths on rocks above MLLW and heights on islets above MHW are typically measured with range finder, so precision is less. Units and precision are shown below.

BASE Editor and S-57 Composer Units:

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

See the HCell Reference Guide for details of conversion from metric to charting units, and application of NOAA rounding.

9. Data Processing Notes

There were no significant deviations from the standards and protocols given in the HCell Specification and HCell Reference Guide.

10. QA/QC and ENC Validation Checks

H11687 was subjected to QA checks in S-57 Composer prior to exporting to the metric HCell base cell (000) file. The millimeter precision metric S-57 HCell was converted to chart units and NOAA rounding applied. dKart Inspector was then used to further check the data set for conformity with the S-58 ver. 2 standard (formerly Appendix B.1 Annex C of the S-57 standard). All tests were run and warnings and errors investigated and corrected unless they are MCD approved as inherent to and acceptable for HCells.

11. Products

11.1 HSD, MCD and CGTP Deliverables

H11687_CS.000	Base Cell File, Chart Units, Soundings and features compiled to 1:350,000
H11687_SS.000	Base Cell File, Chart Units, Soundings and Contours compiled to 1:50,000
H11687_DR.pdf	Descriptive Report including end notes compiled during office processing and certification, the HCell Report, and supplemental items
H11687_outline.gml	Survey outline
H11687_outline.xsd	Survey outline

11.2 Software

CARIS HIPS Ver. 6.1	Inspection of Combined BASE Surfaces
CARIS BASE Editor Ver. 2.3	Creation of soundings and bathy-derived features, creation of the depth area, meta area objects, and Blue Notes; Survey evaluation and verification; Initial HCell assembly.
CARIS S-57 Composer Ver. 2.1	Final compilation of the HCell, correct geometry and build topology, apply final attributes, export the HCell, and QA.
CARIS GIS 4.4a	Setting the sounding rounding variable for conversion of the metric HCell to NOAA charting units with NOAA rounding.
CARIS HOM Ver. 3.3	Perform conversion of the metric HCell to NOAA charting units with NOAA rounding.
HydroService AS, dKart Inspector Ver. 5.1, SP 1	Validation of the base cell file.
Northport Systems, Inc., Fugawi View ENC Ver.1.0.0.3	Independent inspection of final HCells using a COTS viewer.

12. Contacts

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

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APPROVAL SHEET
H11687

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.

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 disproof of charted data within the survey limits. The survey records and digital data comply with OCS requirements except where noted in the Descriptive Report and are adequate to supersede prior surveys and nautical charts in the common area.

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