

W00036

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. **W00036**

LOCALITY

State **Alaska**

General Locality **Christian Sound**

Sublocality **Hazy Island**

.....
2001
.....

CHIEF OF PARTY

.....
William Gilmour
.....

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

W00036

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 Christian Sound

Sublocality Hazy Island

Scale 1:10,000

Date of Survey 05/19/01-05/24/01

Instructions Dated _____

Project No. _____

Vessel R/V DAVIDSON

Chief of Party William Gilmour

Surveyed by Thales GeoSolutions

Soundings taken by echo sounder, hand lead, pole Reson 8111

Graphic record scaled by Thales GeoSolutions

Graphic record checked by Thales GeoSolutions

Evaluation by S. Allen

Automated plot by HP Design Jet 1050C

Verification by R. Shipley

Soundings in Meters at MLLW

REMARKS: All times are UTC.

Revisions and annotations appearing as endnotes were

generated during office processing.

All seperates are filed with the hydrographic data.

As a result, page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to MLLW unless

otherwise noted. UTM Projection (zone 8).



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-6349

February 11, 2009

MEMORANDUM TO: Captain John E. Lowell, NOAA
Chief, Marine Chart Division

THROUGH: Jeffrey Ferguson
Chief, Hydrographic Surveys Division

FROM: Gary C. Nelson
Cartographic Team Leader
Pacific Hydrographic Branch

SUBJECT: Approval Memorandum for W00036
Alaska, Christian Sound
Hazy Island

The Pacific Hydrographic Branch has completed evaluation and chart application of Outside Source Data survey W00036. This survey was conducted for the Alaska Department of Fish and Game by Thales Geosolutions (Pacific) Inc. in 2001. I have reviewed the data, reports and compilation to the chart. Data are suitable for nautical charting except where specifically recommended in the Evaluation and Quality Assurance Memorandum and Chart Application Memorandum.

Within the 2008 NOAA Hydrographic Survey Priorities (NHSP), the area in the vicinity of the Hazy Islands is listed as "Priority 1". Due to the incomplete coverage in the Priority area and quality issues it is recommended the area remain as "Priority 1".

Further, it is recommended the survey area should be classified as Category of Zone of Confidence (CATZOC) "B" if used to update ENC survey area classification.

cc: Chief, HSD Operations Branch N/CS31





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-6349

July 30, 2007

MEMORANDUM TO: Commander David O. Neander, NOAA
Chief, Pacific Hydrographic Branch

FROM: LT John J. Lomnicky, NOAA
Benthic Mapping Specialist

SUBJECT: Review of Outside Source Data Survey W00036 (Hazy Islands)
Thales GeoSolutions (Pacific), Inc./Alaska Dept. of Fish and
Game/National Marine Fisheries Service
Fishery Habitat Mapping

I have reviewed outside source hydrographic survey W00036 with regard to data integrity and completeness of the data submission package, survey field procedures, data processing and quality assurance methods, and overall data accuracy and data quality. Survey W00036 exhibits the following deficiencies with regards to the specifications and requirements set forth in the NOS Hydrographic Surveys Specifications and Deliverables Manual (HSSDM):

- The hydrographer did not install a tide gauge within the survey area. Tides were based on a NOAA primary tide gauge outside of the survey area. Minor errors associated with incomplete tidal information have not been noted in the data.
- Data density does not support current NOAA gridding standards.
- Due to the age of the survey, error models have not been supplied.

Special attention should be given to the following:

- For recommendations in specific areas, refer to the Hydrographic Survey Outside Source Data Quality Assurance Checklist for this survey.

Final Recommendations:

- The data should be used to chart soundings and depth curves representing general bathymetric trends, and update shoals/rocky areas that are not adequately depicted on NOAA charts. Data should be charted in areas where W00036 found shoaler soundings than the chart. For safety, charted shoal sounding in near shore areas should not be removed from the charts.
- Although MBES data in this survey may meet higher requirements, the survey area should be classified as Category of Zone of Confidence (CATZOC) "B" if used to update ENC survey area classification.





UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE OFFICE OF COAST SURVEY

Pacific Hydrographic Branch Seattle, Washington

98115-6349

February 4, 2009

MEMORANDUM TO: Commander Dave O. Neander
Chief, Pacific Hydrographic Branch

FROM: Rick Shipley
Cartographer, Pacific Hydrographic Branch

SUBJECT: Application of Outside Source Data Survey W00036
Thales / National Marine Fisheries Service
Multibeam Echosounder Survey in the Vicinity of
Hazy Island, Alaska

I concur with all recommendations by the reviewer Shyla Allen except where noted in their reports.

Summary of compilation:

- soundings, curves and features applied
- no rocks, shoals were superseded
- shoreline was retained as charted
- bottom characteristics were retained
- no aids to navigation survey area
- no additional Dangers to Navigation were found during compilation

It is recommended that OSD survey W00036 supersede charted information within the common area and applied to charts 17320 and 17400.

Record of Application to Charts is attached.

Review and Approved _____

Gary Nelson, Cartographer Team Leader
Pacific Hydrographic Branch

THALES



**ALASKA DEPARTMENT
OF
FISH & GAME**

FISHERY HABITAT MAPPING

DESCRIPTIVE REPORT

Thales Document No: TGP-2251-RPT-01-00

Applicable to:	Thales GeoSolutions (Pacific), Inc.
Controlled by:	Survey Manager Thales GeoSolutions (Pacific), Inc. 3738 Ruffin Road San Diego, CA 92123
Telephone:	(858) 292-8922
Facsimile:	(858) 292-5308

**REPORT CERTIFICATION
FOR**

**ALASKA DEPARTMENT
OF
FISH & GAME**

**FISHERY HABITAT MAPPING
2251**

This issue of the report has been approved by:

- 1 Project Manager Robert Pawlowski _____
- 2 Survey Manager William Gilmour _____

This report has been distributed to:

- 1 Alaska Department of Fish & Game 1 Copy
- 2 Moss Landing Marine Laboratories 1 Copy
- 3 Thales GeoSolutions (Pacific), Inc. 1 Copy

The following versions of this report have been issued:

0	9/12/01	Fishery Habitat Mapping	TG / DA	WG	RP
REV	DATE	DESCRIPTION	APPROVED		

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3. Crossline Comparisons
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1. **AREA SURVEYED**

Thales GeoSolutions (Pacific), Inc. was contracted by the Alaska Department of Fish and Game to perform a detailed multibeam echosounder survey at Hazy Islands under contract number IHP-01-091. The survey required digital, high-resolution multibeam bathymetry along with calibrated backscatter in the area. The Hazy Islands site was located off the coast of Southeast Alaska, in Christian Sound. The site was comprised of 390 square kilometers, in water depths of approximately 50 to 300 meters. Hydrographic data collection began on May 19, 2001 and ended on May 24, 2001.

The Hazy Islands site is bounded by the coordinate listing below:

Table 1-1 Hazy Islands Survey Limits

Point	Latitude	Longitude
1	55.825000 N	134.815278 W
2	55.758056 N	134.610000 W
3	55.810556 N	134.438611 W
4	55.841944 N	134.503056 W
5	55.828056 N	134.548333 W
6	55.850833 N	134.600000 W
7	55.905833 N	134.651944 W
8	55.951944 N	134.572500 W
9	55.983056 N	134.638333 W
10	55.959167 N	134.680278 W
11	55.986944 N	134.745278 W
12	55.890556 N	134.991944 W

The following diagram illustrates the extents of the Hazy Islands survey:

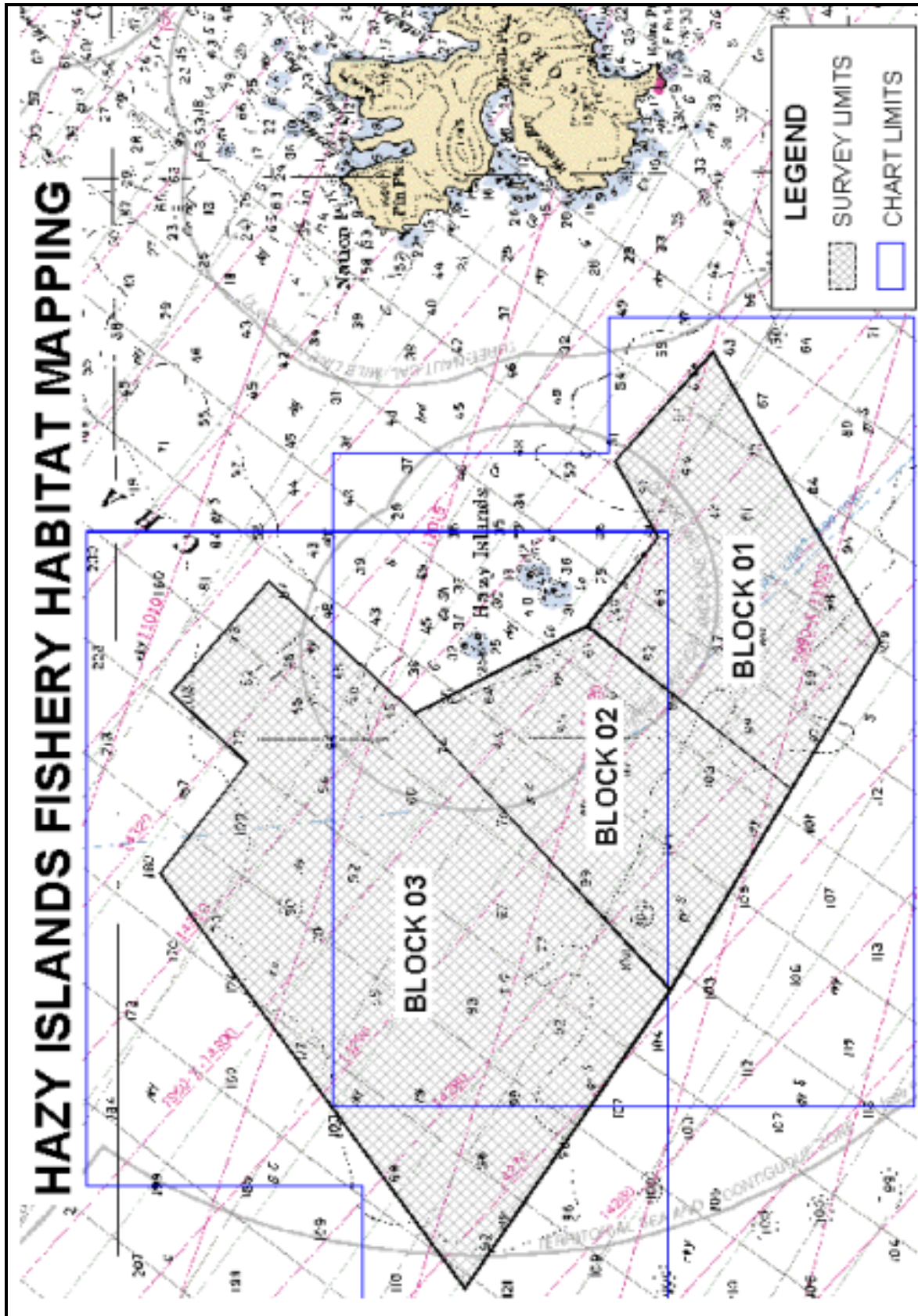


Figure 1-1 Hazy Islands Survey Extents

2. DATA ACQUISITION & PROCESSING

Refer to the TGP-2251-RPT-01-00 Data Acquisition and Processing Report for a detailed description of all equipment, survey vessels, processing procedures and quality control features. Items specific to this survey and any deviations from the Data Acquisition and Processing Report are discussed in the following sections.

2.1. EQUIPMENT & VESSELS

The R/V Davidson acquired all sounding data at Hazy Islands. The Davidson, which is 153 feet in length with a draft of 17.75 feet, was equipped with a Reson 8150 and 8111 for medium to deep-water multibeam data acquisition. For the Hazy Islands survey, multibeam data was acquired exclusively with the Reson SeaBat 8111 (Processor SN 23279 and Transducer Array SN Transmit 0100050/Receive 0700016) with option 033 (pseudo side scan). Vessel attitude was measured using a TSS Heading and Dynamic Motion Sensor (HDMS, IMU SN 078, Processor SN 016) and XTF files logged in Winfrog Multibeam V 3.23 05/18/01. The multibeam computer was equipped with a twelve channel NovAtel GPS receiver card; that output a WGS84 geographical position and a One Pulse Per Second (1 PPS) timing stamp. The Davidson was also equipped with a Seabird CTD (SBE 19 Plus SN 290) for sound velocity profiles.

Refer to TGP-2251-RPT-01-00 Data Acquisition & Processing Report for a complete listing of equipment and vessel descriptions.

2.2. QUALITY CONTROL

2.2.1. Crosslines

The Hazy Islands survey area was divided into three blocks for survey operations. Quality control tie lines were planned to measure 5 percent of the main scheme line length. Because of the irregular shapes of the survey blocks, 5 tie lines were surveyed across the blocks. The total cross line length was 77.1 km (41.6 nautical miles) or 17.8 percent of the total main scheme miles. A total of 15 tie line crossings were examined using the CARIS HIPS Q/C report. All QC tie lines passed the specified vertical accuracy of IHO Order 1 hydrographic surveys, at the 95 percent confidence level. The individual QC Reports can be viewed in Separate 3.

Note: The QC reports were generated based on the given accuracy specification of:

$$\pm \sqrt{a^2 + (b * d)^2}$$

Where:

a = 0.5,
b = 0.013 and,
d = depth.

However, since a variance of a difference, rather than a variance from a mean is being used, the a and b values defined in the makehist.cla file within CARIS will use:

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

2.2.2. Data Quality

Throughout the survey at Hazy Islands, the quality of acquired multibeam and backscatter data was generally good, with the exception of certain minor compromises to data quality during periods of bad weather.

A heave related artifact is apparent in the multibeam data, when the data is viewed via the sun illuminated images. The artifacts are more apparent in the areas surveyed during rougher sea conditions, due to long period swells. The magnitude of these errors is less than 0.25 meters and well within the error budget, as verified by the quality control checks.

The backscatter data were more sensitive to bad weather than the multibeam data and is quite clearly seen in the data set. The most severe weather conditions occurred during the survey of Block 3, where the east section of the block shows some data collected during extremely bad sea conditions. Some of these lines were re-run at a later stage of the survey operations, as they were unusable for mosaic generation.

2.2.3. Quality Control Checks

Refer to the TGP-2251-RPT-01-00 Data Acquisition and Processing Report for the results of the multibeam patch tests conducted prior to the survey at Hazy Islands.

Positioning system confidence checks were conducted on a daily basis using the graphics interface of the acquisition computer. Winfrog Multibeam (WFMB) had built in QC windows, where the positioning data were displayed and monitored in real-time. The graphics window was configured to show the navigation information in plan view. This includes vessel position, survey lines, and background plots and charts. The vehicle window can be configured to show any tabular navigation information required. Typically, this window displays: position, time, line name, heading, HDOP, speed over ground, distance to start of line, distance to end of line and distance off line. The Calculation window is used to look at specific data items in tabular or graphical format. On-line operators look here to view 1PPS performance, GPS satellite constellation, and positional solutions.

2.3. CORRECTIONS TO ECHO SOUNDINGS

Refer to the TGP-2251-RPT-01-00 Data Acquisition and Processing Report for a detailed description of all corrections to echo soundings.

2.4. BACKSCATTER

Processing of the backscatter data revealed an intensity problem starting at nadir and faded across the swath to the outer edges. This resulted in a dark streaked mosaic that limited interpretation of geologic features within the vicinity of nadir. While gains, filters, and manipulation during processing reduced some of the problems, a clean mosaic could not be compiled at sea, requiring the mosaicked data to be manipulated further at Thales GeoSolutions (Pacific), Inc. office in San Diego. Due to the problems encountered with the mosaicked data, several lines were re-run at Hazy Islands to improve backscatter images.

3. HORIZONTAL & VERTICAL CONTROL

3.1. HORIZONTAL CONTROL

The horizontal control datum for this survey was the World Geodetic System of 1984 (WGS84). All positions were collected in WGS84.

Two MBX-3 differential receivers, that used U.S. Coast Guard (USCG) network of differential beacons, supplied RTCM corrections to the acquired GPS pseudorange measurements; which subsequently produced WGS84 DGPS positions.

3.2. VERTICAL CONTROL

All sounding data were reduced to MLLW using verified tidal data from one tide gauge located at Sitka, Alaska. The tide gauge at Sitka is operated and maintained by NOAA. The tidal data was downloaded at the Thales GeoSolutions (Pacific), Inc. office in San Diego and subsequently e-mailed to the R/V Davidson at the end of every Julian day.

Table 3-1 Vertical Control Station Specifications

NAME	SIN	LATITUDE	LONGITUDE	ESTABLISHED
Sitka, AK	9451600	57.051667 N	135.341667 W	19/05/38

LCMF Inc. was contracted to provide final tidal zoning for the Hazy Islands survey area. The verified tidal data were then used to correct acquired bathymetric data.

Appendix A – Progress Sheet

A chronological list of activities occurring at Hazy Islands for R/V Davidson is given below:

Table A-2 Hazy Islands Progress

YEAR	JULIAN DAY	DATE	START TIME (UTC)	COMMENTS
2001	134	14/05/01	02:14	Perform Patch Test in Puget Sound
2001	135	15/05/01	05:00	Depart Seattle, WA enroute to Craig, AK
2001	138	18/05/01	07:00	Anchored off Craig, AK
2001	138	18/05/01	16:45	Embarked ADF&G and Thales personnel
2001	138	18/05/01	19:45	Embarked Thales Personnel
2001	138	18/05/01	20:30	Underway to Hazy Islands Site
2001	139	19/05/01	04:00	Commence Survey at Hazy Islands
2001	140	20/05/01	05:25	Completed Block 1 survey at Hazy Islands
2001	143	23/05/01	03:18	Completed Block 3 survey at Hazy Islands
2001	144	24/05/01	04:45	Completed Block 2 survey at Hazy Islands
2001	144	24/05/01	19:10	Completed re-runs and tie lines. Hazy Islands Survey Complete



Title:

HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE CHECKLIST

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Registry No: _____

State: _____

General Locality: _____

Sub Locality: _____

Dates of Survey: _____

OSD Supplier: _____

OSD Project No: _____

Reviewer: _____ **Review Date:** _____

I. DATA INVENTORY

A. Reports

Report Type	Format	Document Title	Date
Descriptive Report or equivalent			
Data Acquisition and Processing Report or equivalent			
Horizontal and Vertical Control Report or equivalent			
System Certification Report or Equivalent			
Other			

B. Data

Data Type	Format	Description (Raw, Processed)
Smooth Sheet Sounding Plots		
XYZ ASCII Files		
Multibeam		
Side Scan Sonar		
LIDAR		
Single Beam		



Title:

HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE CHECKLIST

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II. DATA ACQUISITION AND PROCESSING

A. System Calibrations and/or Certifications

_____ A sensor offset and alignment survey was conducted to NOAA HSSDM requirements

_____ Offset values provided

_____ Patch tests were conducted for shallow-water multibeam systems

_____ Alignment bias and latency values provided

_____ Draft measurements were conducted

_____ Static Draft _____ Dynamic Draft _____ Loading

_____ Draft values were provided

_____ Sensors were calibrated in accordance with manufacturer requirements and NOAA specifications

_____ Calibration reports were provided.

B. Sound Velocity Corrections

_____ Sound velocity sampling regimen is in accordance with NOAA HSSDM requirements

_____ Sound velocity profiles were supplied

_____ All profiles appear valid

C. Water Levels

_____ Water level measuring equipment and methods are consistent with NOAA equipment and methods and are capable of meeting specifications

Equipment / method used: _____

_____ Tide corrector files were supplied

_____ All tide correctors appear valid

_____ Water level correctors applied to sounding data

_____ Verified _____ Observed _____ Predicted _____ NOAA Zoning _____ Other zoning

_____ Water level error estimate provided by CO-OPS

Water level / zoning error estimate: _____



Title:

HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE CHECKLIST

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E. Survey Methodology

_____ The surveyor has conducted adequate quality control of horizontal positioning data

_____ DTM, BASE surface, and/or mosaics indicate that seafloor coverage requirements (per NOAA HSSDM) were met and no significant coverage holidays exist.

_____ All least depths over shoals, wrecks, rocks, obstructions, and other features have been determined

_____ The Hydrographer has conducted the required quantity of cross lines, or acquired sufficient redundant data, in accordance with the HSSDM, to assess internal data consistency.

F. Data Processing and Quality Control

_____ An adequate description of data processing and quality control methods is provided in documentation.

Processing software used: _____

_____ Data processing methodology is robust enough and adequate to provide a dataset suitable for charting.

_____ Data have been reviewed and are cleaned appropriately with no noise, fliers, or systematic errors noted.

_____ Crossline agreement or redundant data overlap has been visually inspected by the hydrographer

_____ Disagreements have been noted

_____ A Chart comparison was conducted by the hydrographer

_____ Disagreements have been noted.



Title:

HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE CHECKLIST

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III. DATA QUALITY AND RESULTS

A. Internal Data Consistency

- _____ Full resolution data was provided in order to gauge the adequacy of cleaning and/or processing of the data.
- _____ A review of the data reveals no positioning errors exceeding NOAA specifications
- _____ Crossline agreement or redundant data overlap shows no disagreements exceeding NOAA HSSDM tolerances.
- _____ Anomalous data (fliers, noise, etc) were apparent in the BASE surface, DTM, and/or selected sounding set.
- _____ Are there any tide errors exceeding NOAA HSSDM requirements observable in the data
- _____ Are there any observable SV errors exceeding NOAA HSSDM accuracy standards.
- _____ All shoals are valid (no fliers) and the proper least depth has been retained.
- _____ Where multiple systems, platforms, and/or sensors were used, junctioning or overlapping data agree within NOAA HSSDM tolerance between platforms.
- _____ Any statistical assessment of the data (e.g. BASE standard deviation, QC reports, etc) indicate that data agree within NOAA HSSDM tolerances.

B. Error Budget Analysis

- _____ An error budget analysis was provided by the surveyor
 - _____ The error budget analysis indicates that data are capable of meeting NOAA HSSDM standards
 - _____ The evaluator concurs with the provided error budget analysis
- _____ The evaluator has conducted an error budget analysis
 - _____ The error budget analysis indicates that data are capable of meeting NOAA HSSDM standards

D. Automated Wreck and Obstruction Information System (AWOIS) Items

- _____ AWOIS Items are located within the limits of the survey.
 - _____ AWOIS Items can be sufficiently confirmed or disproved using data from this survey (Attach AWOIS pages to the certification memorandum.).



E. Dangers to Navigation

- _____ Dangers to Navigation (DTONs) were selected and submitted by the surveyor / data provider
- _____ DTONs have been verified by the office evaluator.
- _____ Additional DTONs were noted during office evaluation and submitted

F. Aids to Navigation

- _____ Aids to Navigation (ATONs) were positioned during this survey
- _____ New ATONS were positioned during this survey
- _____ Survey positions match charted positions
- _____ The surveyor / data provider issued DTONs or notified the USCG for any ATON discrepancies
- _____ ATON discrepancies were noted during office evaluation and submitted as DTONs.

G. Shoreline and Bottom Samples

- _____ The shoreline (MHW and/or MLLW lines) were included as part of this survey
- _____ Surveyed shoreline matches charted shoreline
- _____ Surveyed shoreline compares with NGS/RSD source data
- _____ Surveyed shoreline should be used to revise nautical charts
- _____ Shoreline features were positioned during this survey
- _____ Surveyed features match charted shoreline
- _____ Surveyed features compares with NGS/RSD source data
- _____ Surveyed features should be used to revise nautical charts
- _____ Bottom samples were acquired during this survey
- _____ Bottom sample spacing was in accordance with NOAA HSSDM requirements
- _____ Bottom samples should be used to update NOAA charts



Pacific Hydrographic Branch

Document #:

PHB-QA-03

Rev.:

1


Title:

**HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE
CHECKLIST**

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IV. COMMENTS

	Pacific Hydrographic Branch	Document #: PHB-QA-03	Rev.: 1
Title: HYDROGRAPHIC SURVEY OUTSIDE SOURCE DATA QUALITY ASSURANCE CHECKLIST		Page #: 8 of 8	

V. CHART COMPARISON

Affected charts

Chart	Scale	Edition	Date

Smooth Sheet Soundings

Reported Obstructions

Charted Features

New Features

W00036 Hazy Island Chart Comparison

Affected charts

17320	1:217,828	17 th Ed	Nov/05 ¹
17400	1:229,376	17 th Ed	Mar/07 ²

Comparison

The overlapping areas between charts 17320 and 17400 are very nearly identical. Therefore, all comments apply to both charts. Overall, W00036 and the charts agree fairly well (Fig 1). Discrepancies are generally within 4 fathoms.³ The rocky nature of the seafloor and the extreme slope in some areas accounts for many of the discrepancies. As noted, data density does not meet NOAA requirements as set forth in HSSDM 5.1.1.3 (Figs 2 & 3). Acquisition of the shoalest point cannot be guaranteed for all areas, though no extremely deviant soundings are expected.⁴

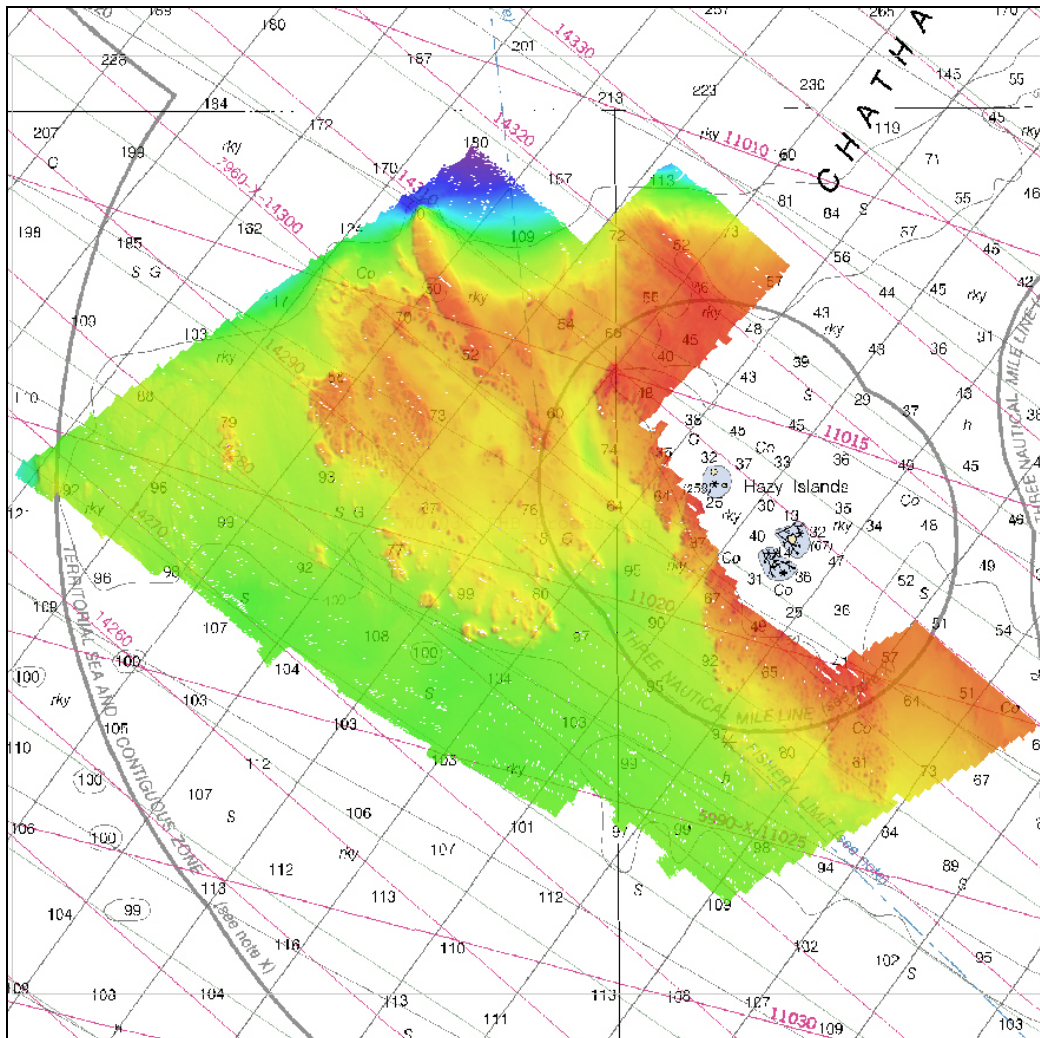


Figure 1. 10m depth grid overlaid on chart 17400

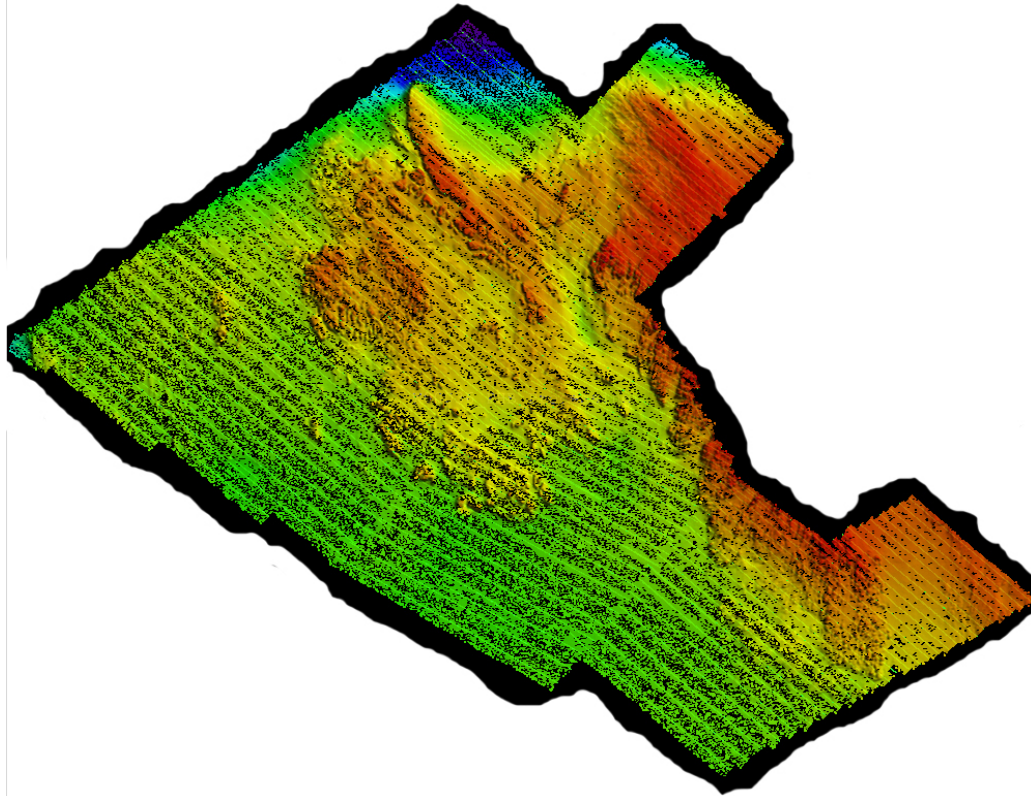


Figure 2. 5m depth grid showing holidays/low sounding density



*Figure 3. 5m density grid
(magenta areas = 1 or 2 sounding contributing to the node)*

Revisions compiled during office processing by the cartographer

¹In PHB processing, W00036 was compared to 17320 18th Edition, continuous maintenance raster dated 01/07/09.

² In PHB processing, W00036 was compared to 17400 17th Edition, continuous maintenance raster dated 01/26/09.

³Concur

⁴ Concur with clarification. Do not supercede charted shoal soundings. Chart survey area as shown on the Hdrawing.

**APPROVAL SHEET
W00036**

Evaluated by:

Shyla Allen
Physical Scientist (Hydrographer)
Pacific Hydrographic Branch

Review by:

Kurt Brown
Hydrographic Team Leader

Cartography

The evaluated survey has been inspected with regard to delineation of the depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data

Compiled by:

Rick Shipley
Cartographer
Pacific Hydrographic Branch

Reviewed by:

Russ Davies
Cartographer
Pacific Hydrographic Branch

Approval

I have reviewed the data, and reports. Data are suitable for nautical charting except where specifically recommended in this report.

Gary Nelson
Cartographic Team Leader
Pacific Hydrographic Branch

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. W00036

INSTRUCTIONS

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

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

CHART	DATE	CARTOGRAPHER	REMARKS
17320	1/26/09	R. Skyles	Full Part Before After Marine Center Approval Signed Via Drawing No. PARTIAL APPLICATION OF SOUNDINGS, FEATURES AND CURVES FROM SMOOTH SHEET.
17400	1/31/09	R. Skyles	Full Part Before After Marine Center Approval Signed Via Drawing No. PARTIAL APPLICATION OF SOUNDINGS, FEATURES AND CURVES FROM SMOOTH SHEET.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
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