

W00267

NOAA Form 76-35A

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Survey

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: W00267

LOCALITY

State: Alaska

General Locality: SW Alaskan Peninsula

Sub-locality: Chirikof Island

2001

PROJECT MANAGER
ROBERT PAWLOWSKI

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

W00267

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: **Alaska**

General Locality: **SW Alaskan Peninsula**

Sub-Locality: **Chirikof Island**

Scale: **10,000**

Dates of Survey: **07/25/2001 to 08/12/2001**

Instructions Dated: **N/A**

Project Number: **OSD-PHB-13**

Field Unit: **Thales GeoSolutions Inc. PERSONNEL**

Project Manager: **Robert Pawlowski**

Soundings by: **MBES**

Imagery by: **N/A**

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **Meters at Mean Lower Low Water**

H-Cell Compilation Units: **Meters at Mean Lower Low Water**

Remarks:

Horizontal Coordinate System: UTM Zone 5N. The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold, red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

THALES



THE TSUNAMI WARNING AND ENVIRONMENTAL OBSERVATORY FOR ALASKA

TSUNAMI HAZARD AND FISHERY HABITAT MAPPING

DESCRIPTIVE REPORT

Thales Document No: TGP-2342-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 |
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**REPORT CERTIFICATION
FOR
THE TSUNAMI WARNING AND
ENVIRONMENTAL OBSERVATORY
FOR ALASKA
TSUNAMI HAZARD AND
FISHERY HABITAT MAPPING
2342**

This issue of the report has been approved by:¹

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

This report has been distributed to:

- | | | |
|---|--|--------|
| 1 | The Tsunami Warning and Environmental Observatory for Alaska | 1 Copy |
| 2 | Thales GeoSolutions (Pacific), Inc. | 1 Copy |

The following versions of this report have been issued:

| | | | | | |
|-----|----------|--|----------|----|----|
| 0 | 01/10/01 | Tsunami Hazard and Fishery Habitat Mapping | SRH / DA | WG | RP |
| | | | | | |
| REV | DATE | DESCRIPTION | APPROVED | | |

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2. Sound Velocity Profile Data
3. Crossline Comparisons
4. Miscellaneous Logs
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1. AREA SURVEYED

Thales GeoSolutions (Pacific), Inc. was contracted by the Tsunami Warning and Environmental Observatory for Alaska to perform a detailed multibeam echosounder survey at Chirikof Island, under contract number 50-DGNC-0-90017.² The survey required digital, high-resolution multibeam bathymetry along with calibrated backscatter in the area. The Chirikof Island site was located off the coast of the Southwest Alaskan Peninsula. The site was comprised of 1450 square kilometers, in water depths of approximately 100 to 600 meters. Hydrographic data collection began on July 25, 2001 and ended on August 12, 2001.

The Chirikof Island site is bounded by the coordinate listing below:

Table 1-1 Chirikof Island Survey Limits

| POINT | LATITUDE | LONGITUDE |
|-------|-------------|--------------|
| 1 | 55.833333 N | 156.400000 W |
| 2 | 55.567018 N | 156.328386 W |
| 3 | 55.563344 N | 156.269152 W |
| 4 | 55.496734 N | 156.251212 W |
| 5 | 55.492188 N | 156.178840 W |
| 6 | 55.425573 N | 156.161186 W |
| 7 | 55.390567 N | 155.667832 W |
| 8 | 55.457424 N | 155.686930 W |
| 9 | 55.556105 N | 155.428324 W |
| 10 | 55.689879 N | 155.465899 W |
| 11 | 55.591129 N | 155.725307 W |
| 12 | 55.608417 N | 155.947751 W |
| 13 | 55.808333 N | 156.000000 W |
| 14 | 55.808333 N | 156.400000 W |

The following diagram illustrates the extents of the Chirikof Island survey:

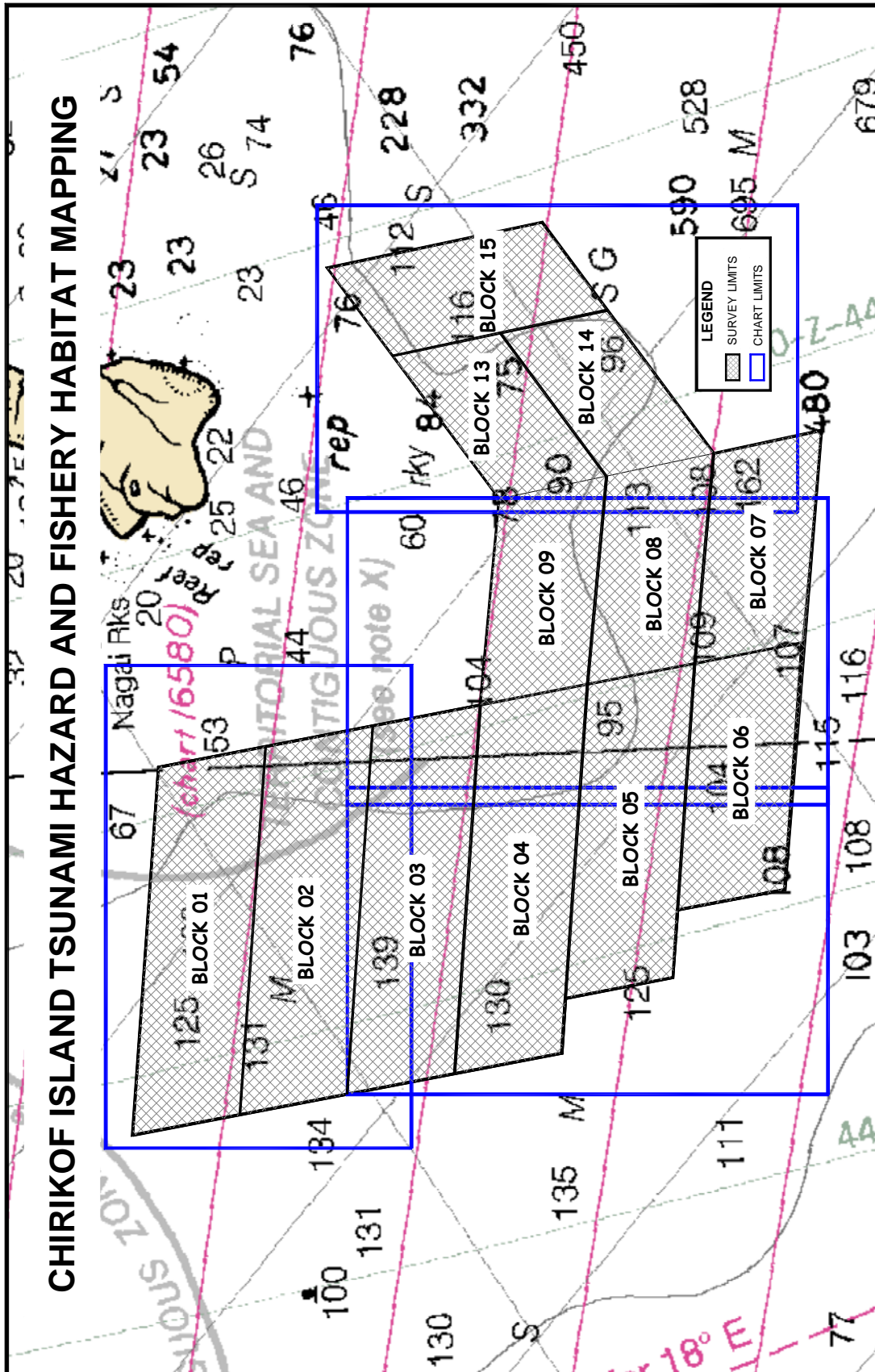


Figure 1-1 Chirikof Island Survey Extents

2. DATA ACQUISITION & PROCESSING

Refer to the TGP-2342-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 Chirikof Island. The Davidson, which is 153 feet in length with a draft of 17.75 feet, was equipped with a Reson 8111 (Processor S/N 23279 and Transducer Array S/N Transmit 0100050/Receive 0700016) for medium water depth multibeam data acquisition. The survey data was acquired exclusively with the Reson multibeam systems' option 033 (pseudo side scan). Vessel attitude was measured using a TSS Heading and Dynamic Motion Sensor (HDMS, IMU S/N 078, Processor S/N 016) and XTF files were logged in Winfrog Multibeam V 3.23 (18/05/01) and Winfrog Multibeam V 3.24d (20/07/01). 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 two SV 2000 Smart Sensors for sound velocity profiles, as well as, a Seabird CTD (SBE 19 Plus S/N 290).

Refer to TGP-2342-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 Chirikof Island survey area was divided into 12 blocks for survey operations. Quality control tie lines were planned to measure 5 percent of the main scheme line length. Since the survey blocks were of irregular shape, 18 tie lines were surveyed across the blocks. The total cross line length was 224.5 km (121.2 nautical miles) or 5.9 percent of the total main scheme miles. A total of 90 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:

$$\begin{aligned} a &= 0.5, \\ b &= 0.013 \text{ and,} \\ d &= \text{depth.} \end{aligned}$$

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:

$$\begin{aligned} a &= 0.5 * \sqrt{2} = 0.707 \\ b &= 0.013 * \sqrt{2} = 0.018 \end{aligned}$$

2.2.2. Data Quality

Throughout the survey at Chirikof Island, the quality of acquired backscatter data was generally good. However it was quite clear that with higher range settings the quality of data started to deteriorate. This was mostly noticeable at range settings of 750 and greater.

The bathymetric data was also generally good with all data meeting IHO first order specifications. In certain areas of the survey sound velocity related errors were apparent. These errors were well within the error budget.³

2.2.3. Quality Control Checks

Refer to the TGP-2342-RPT-01-00 Data Acquisition and Processing Report for the results of the multibeam patch tests conducted prior to the survey at Chirikof Island.

Positioning system confidence checks were conducted on a daily basis using the graphics interface of the acquisition computer. Winfrog Multibeam (WFMB) has built in QC windows where the positioning data was 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 the 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-2342-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 Chirikof Island 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, using the 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 was reduced to MLLW using verified tidal data from one tide gauge located at Sand Point, Alaska. The tide gauge at Sand Point 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 |
|----------------|---------|-----------|------------|-------------|
| Sand Point, Ak | 9459450 | 55.386333 | 160.501666 | 10/09/72 |

LCMF Inc. was contracted to provide final tidal zoning for the Chirikof Island 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 Chirikof Island for R/V Davidson is given below:

Table A-2 Chirikof Island Progress

| YEAR | JULIAN DAY | DATE | START TIME (UTC) | COMMENTS |
|------|------------|----------|---------------------|---|
| 2001 | 205 | 24/07/01 | 21:00 | Testing WinFrog (3.24d) and Patch test |
| 2001 | 206 | 25/07/01 | 02:30 | Commenced Survey at Chirikof Island |
| 2001 | 208 | 27/07/01 | 01:54 | Completed Block 1 survey at Chirikof Island |
| 2001 | 208 | 27/07/01 | 04:15 | Winfrog Testing and Fix |
| 2001 | 208 | 27/07/01 | 21:15 | Fixed GPS Problems |
| 2001 | 209 | 28/07/01 | 03:43 | Re-commenced Survey |
| 2001 | 209 | 28/07/01 | 18:30 | HDMS (Heading & Motion sensor) Problems |
| 2001 | 209 | 28/07/01 | 21:30 | Re-commenced Survey |
| 2001 | 210 | 29/07/01 | 15:36 | Completed Block 2 survey |
| 2001 | 212 | 31/07/01 | 10:48 | Completed Block 3 survey |
| 2001 | 213 | 01/08/01 | 22:30 | Transit & Embarked Thales Personnel |
| 2001 | 214 | 02/08/01 | 5:00 | Re-commenced survey |
| 2001 | 214 | 02/08/01 | 09:29 | Completed Block 4 survey |
| 2001 | 215 | 03/08/01 | 14:42 | Transit & Embarked Thales Personnel |
| 2001 | 215 | 03/08/01 | 21:16 | Commenced Tie Lines 1 - 6 |
| 2001 | 216 | 04/08/01 | 15:53 | Completed Tie Lines 1 - 6 |
| 2001 | 216 | 04/08/01 | 16:45 | Re-commenced Block 5 survey |
| 2001 | 216 | 04/08/01 | 22:22 | Completed Block 5 survey |
| 2001 | 218 | 06/08/01 | 02:11 | Completed Block 6 survey |
| 2001 | 218 | 06/08/01 | 20:30 | Completed Block 7 survey |
| 2001 | 219 | 07/08/01 | 15:41 | Completed Block 8 survey |
| 2001 | 220 | 08/08/01 | 13:42 | Completed Block 9 survey |
| 2001 | 221 | 09/08/01 | 07:35 | Completed Block 13 survey |
| 2001 | 222 | 10/08/01 | 02:35 | Completed Block 14 survey |
| 2001 | 223 | 11/08/01 | 05:16 | Completed re-runs and tie lines 7 – 14 |
| 2001 | 224 | 12/08/01 | 00:53 | Completed Block 15 Survey and Tie Line |
| 2001 | 224 | 12/08/01 | 00:53 | Chirikof Island Survey Complete |

Revisions and corrections performed during office processing and certification

¹ *A signed copy of the Descriptive Report was not submitted; however, the contents of the report have been reviewed and validated by the Pacific Hydrographic Branch.*

² *This survey was completed in 2001 and was conducted to a very high standard and exceeds the HSSD requirements for 2001; Data is within specifications and adequate to supersede charted data in the common area.*

³ *The data is adequate to supersede charted data in the common area.*

APPROVAL PAGE

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Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- W00267_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- W00267_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications.

Approved: _____

Katie Reser
Physical Scientist, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

Peter Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch