

H10977

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. RA-20-06-00

Registry No. H-10977

LOCALITY

State Alaska

General Locality Shelikof Strait

Sublocality Puale Bay

2000

CHIEF OF PARTY

Commander Daniel R. Herlihy, NOAA

LIBRARY & ARCHIVES

DATE

January 4, 2002

HYDROGRAPHIC TITLE SHEET

H-10977

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.

RA-20-06-00

State Alaska

General locality Shelikof Strait

Locality Puale Bay

Scale 1:20,000 Date of survey 6/28/00 - 7/23/00

Instructions dated May 8, 2000 Project No. OPR-P164-RA
Change #1 6/12/2000

Vessel RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125), RA-6(2126), RA-7(2127)

Chief of party CDR Daniel R. Herlihy, NOAA

Surveyed by RAINIER Personnel

Soundings taken by echo sounder, ~~and tide gauge~~ Knudsen 320M, RESON 8101, SEABEAM 1180

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: L. Deodato Automated plot by HP, 750C
~~Processed by~~

Verification by R. Mayor, R. Davies, D. Doles, D. Hill, L. Deodato

Soundings in fathoms ~~xxx~~ at ~~xxxx~~ MLLW and tenths

REMARKS: All times are UTC, revisions and marginal notes in black were
generated during office processing. All separates 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 mean lower
low water unless otherwise noted.

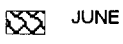
AWAIS/SURF 10/26/01 MCR

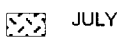
Accomplished	June	July
LNM Singlebeam	81.47	136.29
LNM Multibeam	145.66	1235.21
SQ NM Singlebeam	5.93	2.0
SQ NM Multibeam	15.38	187.3
Total SQ NM	21.32	189.3
SV Casts	12	68
Bottom Samples	0	51
AWOIS Invest.	0	0
Tide gauges	2	0
Control station	0	0
Down time (hr)	5	22.25
Days at Sea	5	15

Sheet A
H10977
58.26 sq nm

Sheet F
H10981
152.9 sq nm

legend

 JUNE

 JULY

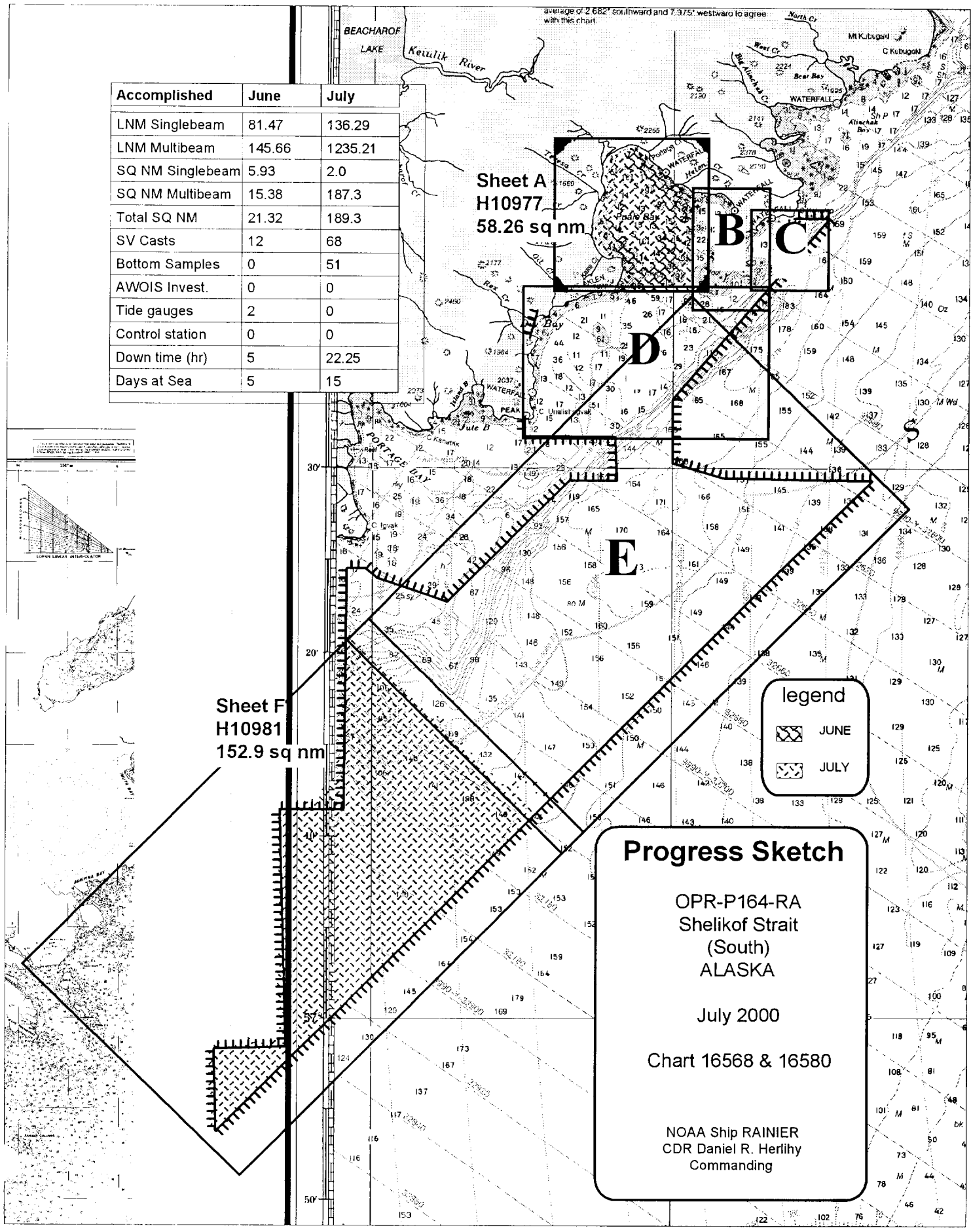
Progress Sketch

OPR-P164-RA
Shelikof Strait
(South)
ALASKA

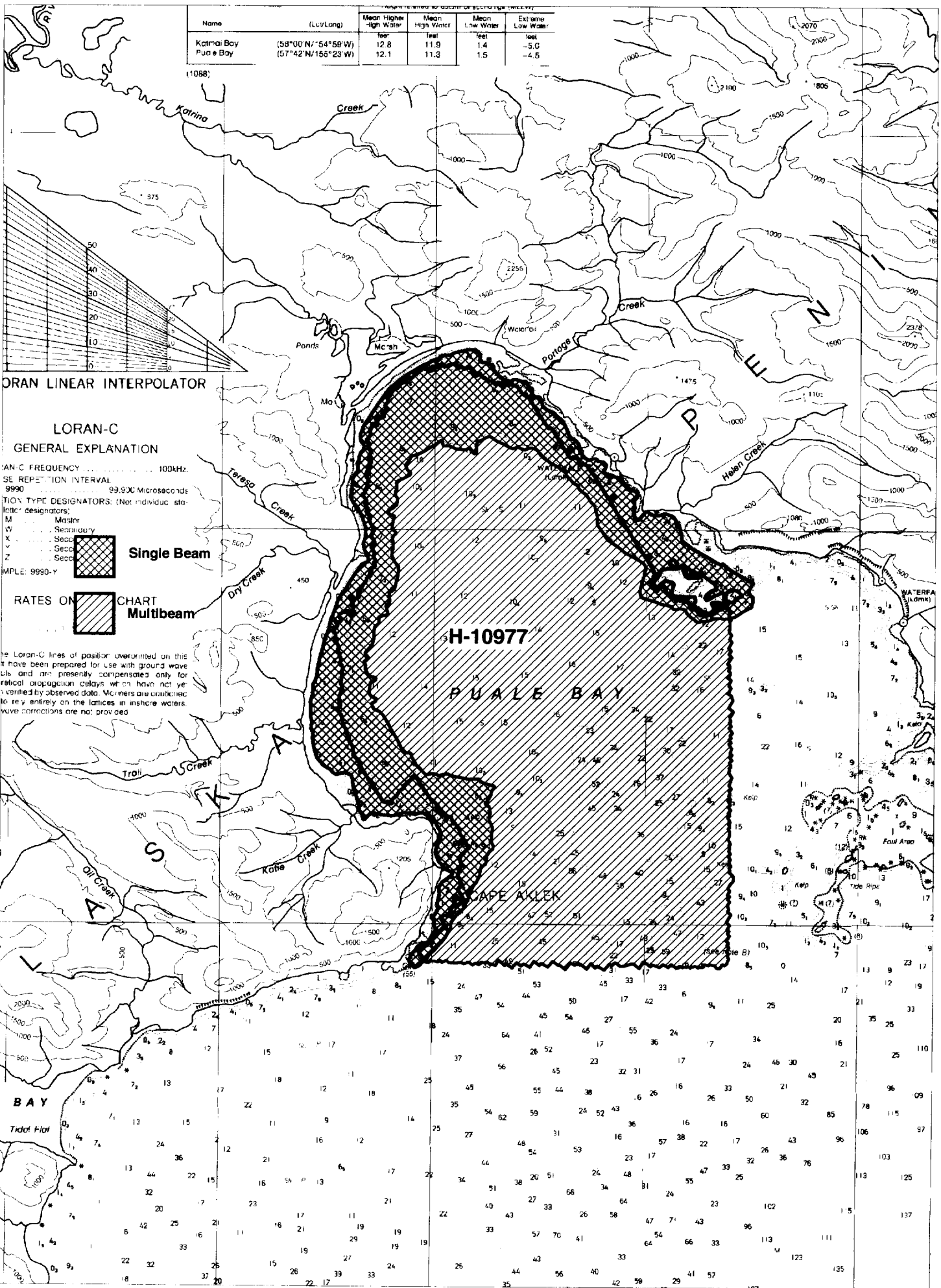
July 2000

Chart 16568 & 16580

NOAA Ship RAINIER
CDR Daniel R. Herlihy
Commanding



Name	(L/U/Long)	Mean Highest High Water	Mean High Water	Mean Low Water	Extreme Low Water
Katmai Bay	(58°00' N / 154°58' W)	12.8	11.9	1.4	feet
Puale Bay	(57°42' N / 155°23' W)	12.1	11.3	1.5	-5.0
					-4.5



ORAN LINEAR INTERPOLATOR

LORAN-C
GENERAL EXPLANATION

TRANSMISSION FREQUENCY 100KHz.
 REPESSION INTERVAL 99.900 Microseconds
 IDENTIFICATION DESIGNATORS: (Not individual, statistical designators:
 M Master
 S Secondary
 X Seco
 V Seco
 Z Seco
 SMPLE: 9990-Y



RATES ON CHART
 Multibeam

The Loran-C lines of position overlaid on this chart have been prepared for use with ground wave signals and are presently compensated only for refraction propagation delays which have not yet been verified by observed data. Mariners are cautioned to rely entirely on the lattices in inshore waters. Wave corrections are not provided.

H-10977

PUALE BAY

CAPE ALEK

BAY

Tidal Flat

Descriptive Report to Accompany Hydrographic Survey H10977

Project OPR-P164-RA-00 Shelikof Strait

Scale 1:20,000

June 28 – July 23, 2000

NOAA Ship RAINIER

Chief of Party: Commander Daniel R. Herlihy, NOAA

A. AREA SURVEYED *See Eval Rpt., section B*

This hydrographic survey was completed as specified by Hydrographic Survey Letter Instructions OPR-P164-RA-00, dated May 8, 2000, and the Draft Standing Project Instructions dated April 6, 1998.

The survey area is Puale Bay, Shelikof Strait, Alaska. The survey's northern limit is ~~latitude~~ *the shoreline* ~~57°45'03.41"N~~ and the southern limit is latitude 57°39'30.17"N. The survey's western limit is ~~longitude~~ *the shoreline* ~~155°35'55.34"W~~ and the eastern limit is longitude 155°27'40.23"W. The eastern survey limit has been modified to include a new reef and the extent of a kelp bed.

Data acquisition was conducted from June 28 to July 23, 2000 (DN 180-205).

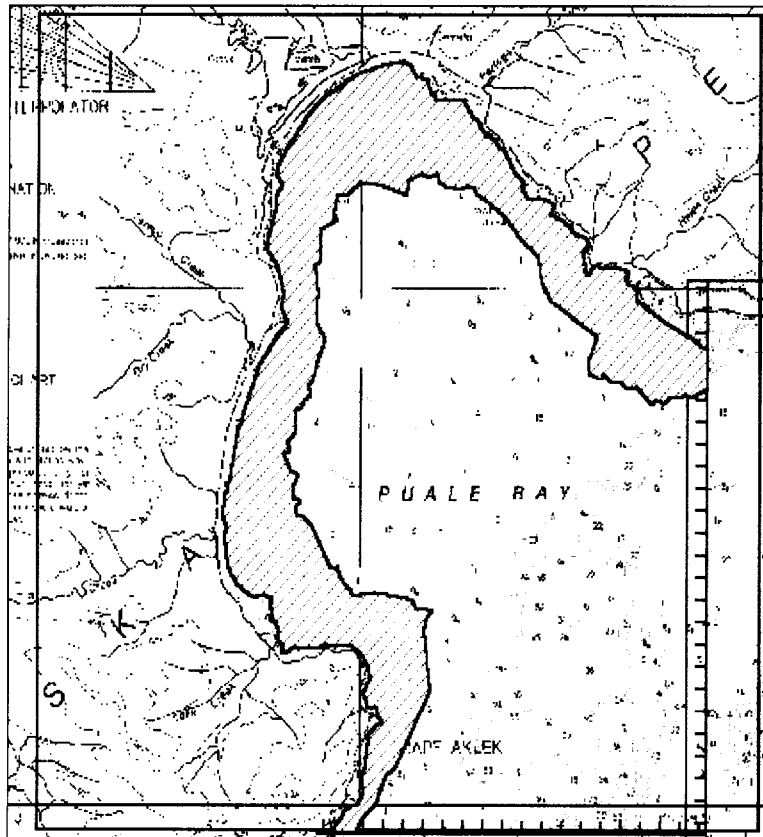


Figure 1: Extent of VBES hydrography for H10977

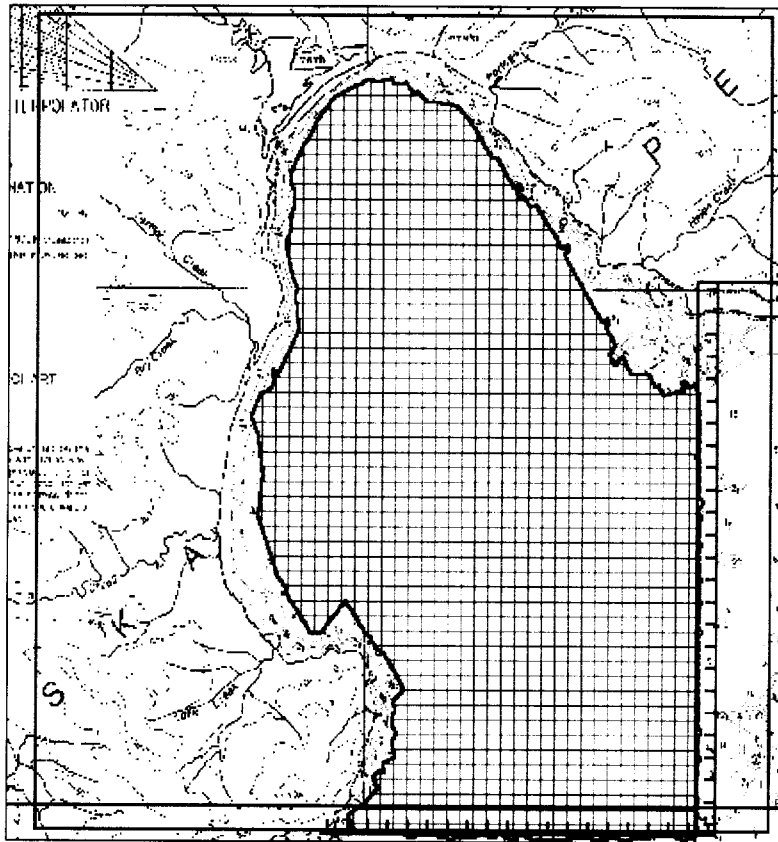


Figure 2: Extent of SWMB coverage for H10977

B. DATA ACQUISITION AND PROCESSING ✓

A complete description of data acquisition and processing systems, survey vessels, quality control procedures, and data processing methods, can be found in the *OPR-P164-RA-00 Data Acquisition and Processing Report* submitted under separate cover*. Items specific to this survey and any deviations from the aforementioned report are discussed in the following sections.

B1. Equipment and Vessels ✓

Data were acquired by RAINIER’s survey launches (vessel numbers 2121, 2122, 2123, 2124, 2125, 2126 and 2127). Vessels 2121, 2123, 2124 and 2126 were used to acquire shallow-water multibeam soundings and sound velocity profiles. Vessels 2122 and 2125 were used to acquire vertical-beam echo soundings and detached positions. Vessel 2127 was used for detached positions. Vessel 2125 was also used to collect bottom samples. No unusual vessel configurations or problems were encountered on this survey.

B2. Quality Control ✓

Crosslines ✓

Vertical-beam echo sounder crosslines totaled 14.84 nautical miles, comprising 7.63% of mainscheme hydrography. Crosslines generally agree within 1 meter of mainscheme hydrography.

Shallow-water multibeam (SWMB) crosslines totaled 45.11 nautical miles, comprising 6.39% of SWMB hydrography. The Quality Control Report (CARIS HIPS) for the checkline file averaged 96.64%, with a

* Filed with the project report for OPR-P164-RA-00.

depth tolerance of 0.013, which conforms to International Hydrographic Organization Order 1 specifications as detailed in Special Publication S-44, Edition 4, and depth accuracy standards set forth in the National Ocean Service Hydrographic Surveys and Specifications and Deliverables Manual. See Appendix V for the detailed report.

Junctions ✓

There are no contemporary surveys that junction with H10977.

Data Quality Factors ✓

During data cleaning in HDCS subset mode, errors in the preliminary tidal zoning scheme of up to 0.5 meters were apparent, making subset cleaning difficult due to numerous vertical shifts in the data. These errors were apparent after application of verified water level data from the primary station at Womens Bay, fully adjusted for the preliminary tidal zoning scheme. The Hydrographer expects that these errors will be corrected with the final tidal zoning scheme.

For the final field sheet verified water level data were used.

In subset cleaning, a heave artifact was observed as a thick line (Figures 3 and 4). This can be attributed to a ground swell ranging up to two meters during data acquisition. In addition, a firmware error was discovered in the Version 3 POS/MV systems on RA-3 and RA-4 (refer to the *OPR-P164-RA-00 Data Acquisition and Processing Report* for further information on the POS/MV), which inadvertently reversed the polarity (sign) of the analog heave supplied to the Elac/Seabeam SWMB. Acquired data were repaired through a utility, "corrHeave", on the SGI, which reversed the sign (+/-) of the heave in the HDCS data. This measure largely improved the quality of the data, although a residual heave error was still noticeable on the days during which the swell was large (close to two meters). To correct for the residual errors in the data, the Hydrographer approximated the bottom through comparison with adjacent lines and crosslines, and rejected data that did not appear to match the contour of the bottom. Data were subsequently examined to ensure that soundings over features were not rejected, and some data were re-accepted if necessary to ensure that shoal soundings were not rejected during this process. Following this procedure, a quality control report (QCR) was generated, which indicated that all data were within allowable limits as specified by the National Ocean Service Hydrographic Surveys and Specifications and Deliverables Manual.

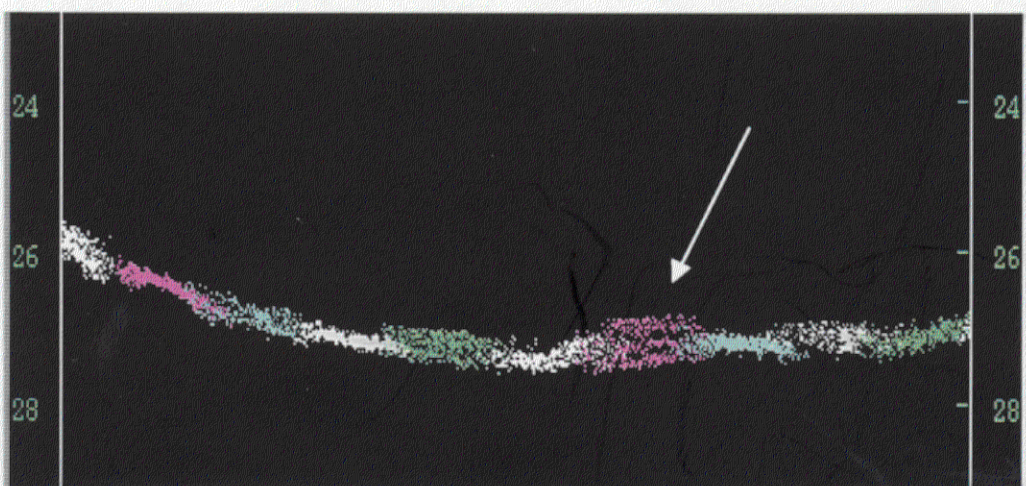


Figure 3: Illustration of heave artifact for H10977

** Filed with the hydrographic data

-3-

* Filed with the project report for OPR-P164-RA-00.

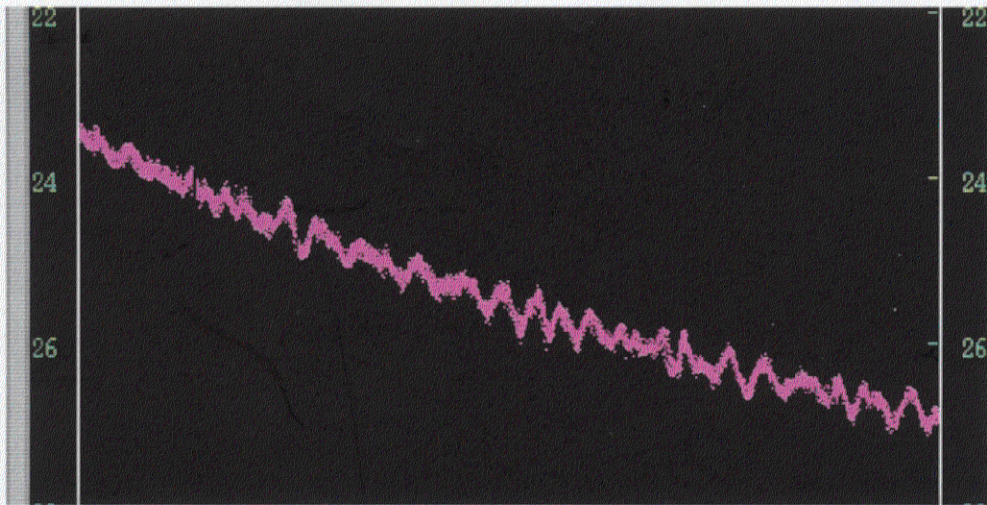


Figure 4: Illustration of heave artifact (side view) for H10977

RAINIER also noticed the heave errors in surveys conducted subsequent to H10977, and is working with the manufacturer of the POS/MV, TSS Inc., to correct this issue.

During data acquisition a significant roll artifact was observed from RA-1 and RA-6 on day numbers 181, 190, 191, and 203 (Figure 5). The seas during data acquisition ranged up to 1.5 meters (5 feet). The Hydrographer estimated the bottom using adjacent lines (Figure 6) and rejected data that did not agree with the bottom contour. Data over features and shoals were re-accepted and included with the final soundings. *Plotted data appears to be consistent with surrounding depths.*

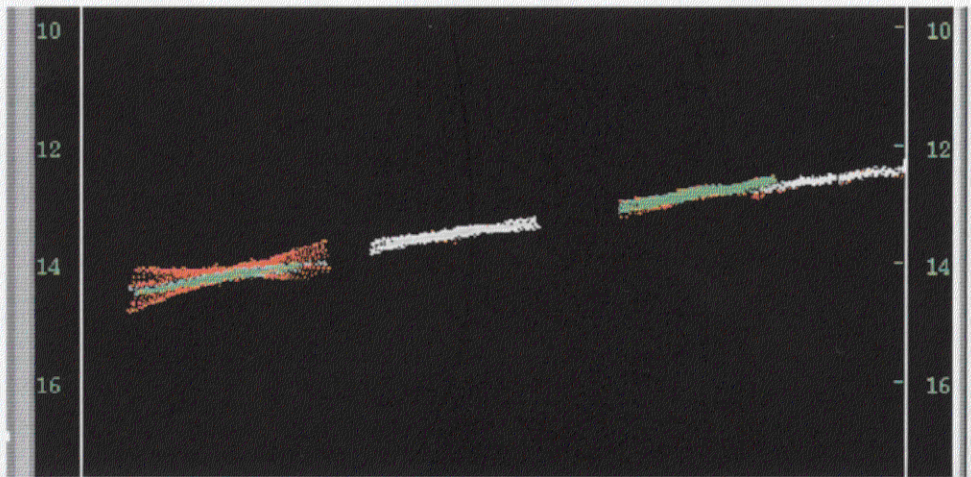


Figure 5: Illustration of roll artifact for H10977

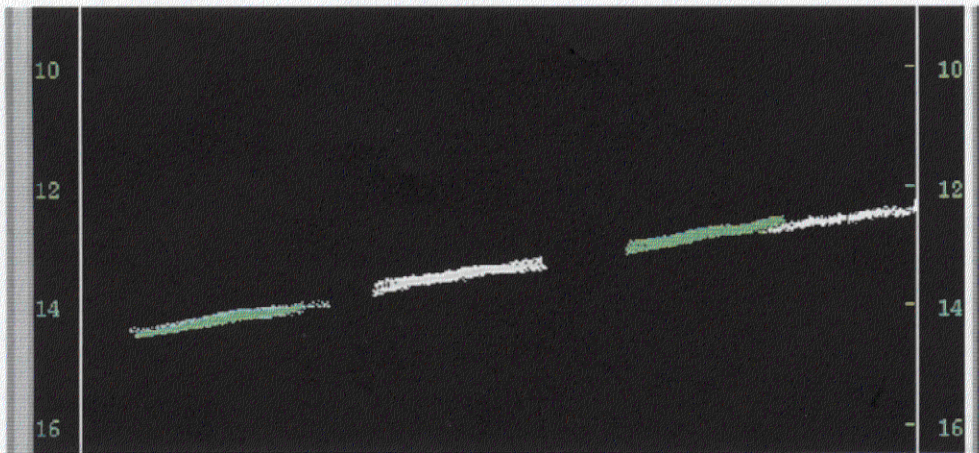


Figure 6: Illustration of roll artifact after cleaning for H10977

Due to time constraints and the even sloping bottom in most near-shore areas of this survey, the Hydrographer did not deem it necessary to obtain 100% SWMB coverage in these areas. As a substitute, the side-scan sonar (SSS) imagery from the Reson SeaBat 8101 was examined, and a SSS mosaic generated, in order to determine if features such as rocks fell between SWMB and VBES data collected in these areas. In the event a feature was detected, additional SWMB data were collected over the feature.

No additional unusual conditions were encountered during the survey that affected the expected accuracy and quality of survey data.

B3. Data Reduction ✓

A character size of 5.0 millimeters was used during excessing in HP Tools ZoomEdit. All other data reduction procedures for survey H10977 conform to those detailed in the *OPR-P164-RA-00 Data Acquisition and Processing Report*. *

C. VERTICAL AND HORIZONTAL CONTROL ✓

A complete description of vertical and horizontal control for survey H10977 can be found in the *OPR-P164-RA-00 Horizontal and Vertical Control Report* submitted under separate cover. A summary of horizontal and vertical control for this survey follows.

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. The U.S. Coast Guard Beacons at Kenai, AK and Kodiak, AK were the sources of differential correctors.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the Field Procedures Manual (FPM). Copies of the performance checks are included in the *OPR-P164-RA-00 Horizontal and Vertical Control Report*. *

* Filed with the project report for OPR-P164-RA-00.

Vertical Control ✓

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station at Kodiak, Alaska (945-7292) will serve as control for datum determination. RAINIER personnel installed Sutron 8200 “bubbler” tide gauges at the following subordinate stations in accordance with the Project Instructions:

Station Name	Station Number	Type of Gauge	Date of Installation	Date of Removal
Puale Bay	945-8209	30-day	05/23/2000	06/24/2000
Poltava Island	945-8471	30-day	06/27/2000	07/25/2000

Raw water level data from these gauges were forwarded to N/OPS1 throughout the project period, with the final package submitted on September 2, 2000 in accordance with HSG 50 and FPM 4.7. 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 survey H10977 was forwarded to N/OPS1 on August 16, 2000 in accordance with FPM 4.8. *Approved tide note dated November 9, 2000 is attached.*

D. RESULTS AND RECOMMENDATIONS ✓

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

No AWOIS items were located within the limits of H10977. *concur*

D.2 Chart Comparison ✓ *See Eval Rpt., section O*

Survey H10977 was compared with chart 16575 (1st Ed., April 15, 198⁹, Scale 1:80,000).

Depths from chart 16575 generally agreed with survey depths within ~~two~~^{one} fathoms, with occasional differences of up to three fathoms. A few charted depths were found to be shoaler than the current survey and are addressed below. These areas were fully developed with 100% shallow-water multibeam. The following comparisons address items not otherwise submitted as dangers to navigation (refer to section D.4 for danger to navigation information).

In the vicinity of a charted sounding of 25 fathoms (57° 41' 32.50" N, 155° 29' 41.31" W; 351291.4 E, 6397197.7 N), survey soundings show the shoalest depth as 34 fathoms. *✓ Depths of 24-25 fathoms were found approximately 300 meters east on the present survey.*

In the vicinity of a charted sounding of 45 fathoms (57° 40' 54.21" N, 155° 31' 39.89" W; 349284.4 E, 6396086.8 N), survey soundings show 5¹ fathoms. The area is over a ridge and was covered with 100% SWMB. *✓ Depths of 44-45 fathoms were found approximately 300 meters ¹⁶ on the present survey.*

In the vicinity of a charted sounding of 59 fathoms (57° 39' 39.58" N, 155° 29' 30.49" W; 351308.6 E, 6393700.7 N), survey soundings show 5⁸ fathoms.

In the vicinity of a charted sounding of 9 fathoms, 5 feet (57° 39' 28.85" N, 155° 29' 00.64" W; 351824.5 E, 6393350.7 N), survey soundings show 10.9⁶ fathoms. Survey H10977 also shows a shoal depth of 9.8⁷ fathoms approximately 200⁸⁰ meters to the northeast of the charted sounding. *chart 94*

In the vicinity of a charted sounding of 32 fathoms (57°43'12.38"N, 155°29'18.63"W; 351780.3 E, 6400271.3 N), survey soundings show ²⁵⁻³¹~~27~~ fathoms.

In the vicinity of a charted sounding of 9 fathoms, ³~~5~~ feet (57°44'53.53"N, 155°32'30.31"W; 348727.2 E, 6403515.8 N), survey soundings generally agree, although survey H10977 found this ridge to extend ²²⁰~~200~~ meters to the ^{south}~~north~~. *Present survey depths range from 9.4-9.9 fathoms along this ridge. Chart 92*

In the vicinity of a charted sounding of 0 fathom, 1 foot (57°40'16.98"N, 155°34'28.05"W; 346419.5 E, 6395041.1 N, chart 16580 rock), survey soundings show 1.8 fathoms. This area was covered with VBES within a 70-meter search radius (Positions 21479-21511, 23080-23090). The Hydrographer believes this is a submerged rock and recommends replacing the charted depth with a rock with a known depth. *Chart 13 rky*

Survey H10977 was compared with chart 16580 (10th Ed., July 18, 1998, Scale 1:350,000). Depths from chart 16580 generally agreed within ~~2~~ fathoms. Some discrepancies with differences of up to 3 fathoms were noted. *Present survey is generally shoal biased.*

D.3 Shoreline ✓ *See Eval Rpt., section J.*

Method of Shoreline Verification ✓

N/NGS3 supplied photogrammetric shoreline data in raster format for T-00622, T-00625 and T-00626 ✓ for use as source shoreline. The T-Sheet raster images were registered and digitized in MapInfo by RAINIER personnel and the resultant vector data were used in Hypack for field verification. In addition, features shown on the current editions of charts 16575 and 16580 were digitized in MapInfo by RAINIER personnel and displayed in Hypack for field verification.

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch was five to several hundred meters offshore of apparent mean low-water line. Water depths along this limit of safe navigation are approximately four meters at Mean Lower-Low Water (MLLW). Features unreachable by survey launch are depicted on the Detached Position Plot as the Hydrographer's approximate representation of the shoreline.

Detached positions (DPs) taken during shoreline verification were recorded in HYPACK and on DP forms, ^{**} and processed in HPS. These indicate revisions to features, and features not found on the T-Sheet or chart. In addition, hard copies of applicable digitized T-Sheets were taken into the field and annotated by hand to reflect verification of source features and updates to both the chart and T-Sheet. DP forms ^{**} are included in Section I of the *Separates to be Included with Survey Data*.

A detailed Detached Position and Bottom Sample Plot, in both paper copy and MapInfo format, is provided showing all detached positions and bottom samples with notes relating to each feature. The updated shoreline and features are also depicted on the final sounding plot.

Source Shoreline Changes and New Features ✓

Several changes and new features were found and are depicted on the final Detached Position Plot. T-sheet and charted rocks were often identified as high points or extents of new ledges and new reefs.

The limits of an area foul with kelp depicted on the T-Sheet at position 57°44'14.14"N, 155°28'48.83"W ✓ (352343.1 E, 6402162.4 N) were revised by the Hydrographer. The foul limit was delineated by vessel *** Filed with the hydrographic data.*

track line data obtained during shoreline verification. These data were acquired at low tide or as close to low tide as possible. At higher stages of tide, limited penetration with a vertical-beam echo sounder launch was possible, allowing some soundings to be taken in the area at a line spacing of 50 meters. An area foul with kelp is depicted on the T-sheet shoreward of this foul area at position $57^{\circ}44'50.08''\text{N}$, $155^{\circ}28'33.83''\text{W}$ (352631.7 E, 6403264.3 N). Several T-sheet and charted rocks were found to be located within these designated foul areas and were unreachable by survey launches, and were verified visually from a distance to the best of the Hydrographer's ability. These rocks are noted on the DP and BS Plot as well as in the Mapinfo table "H10977_ShorelineNotes." *T-sheet rocks were shown on smooth sheet.*

The T-Sheet/charted (16575) ledge at $57^{\circ}45'58.92''\text{N}$, $155^{\circ}31'24.01''\text{W}$, (349863.6 E, 6405496.6 N) was not verified with the amount of kelp present. The Hydrographer recommends retaining this ledge as charted. *T-sheet ledge were shown on smooth sheet.*

A new rock was found and defined with detached position 22634 at $57^{\circ}46'10.37''\text{N}$, $155^{\circ}31'52.23''\text{W}$, (349445.3 E, 6405867.5 N) and detached position 22635 at $57^{\circ}46'09.4''\text{N}$, $155^{\circ}31'52.37''\text{W}$, (349441.9 E, 6405837.5 N). These two positions indicate the same rock. *One rock shown on smooth sheet,*

as a
The T-Sheet broken ledge/charted (16575) rock at $57^{\circ}45'10.49''\text{N}$, $155^{\circ}29'44.9''\text{W}$, (351378.6 E, 6403941.2 N) was revised by the Hydrographer. The seaward most extent is defined by detached position 70001. The Hydrographer recommends removing the rock from the chart and charting the extents of the ledge as depicted on the Detached Position Plot. *Concur*

Several shoal areas were found during shoreline verification at $57^{\circ}46'08.84''\text{N}$, $155^{\circ}31'49.77''\text{W}$ (349484.3 E, 6405818.5 N, Position # 22631), $57^{\circ}46'25.20''\text{N}$, $155^{\circ}32'17.66''\text{W}$ (349042.5 E, 6406341.5 N, Position # 22606), and $57^{\circ}46'50.83''\text{N}$, $155^{\circ}32'58.00''\text{W}$ (348406.1 E, 6407159.0 N, Position # 22597). The least depths were found to be 1.4 fathoms for DP 22631, 1.5 fathoms for DP 22606, and 1.6 fathoms for DP 22597.

The T-sheet/ charted (16575, 16580) rock at $57^{\circ}47'09.32''\text{N}$, $155^{\circ}33'44.86''\text{W}$ (347654.0 E, 6407759.5 N, Position # 23077) was disproved with a five-minute visual and echo-sounder search within a 25-meter search radius in water with two-to-three meter visibility. A new rock was found at $57^{\circ}47'06.84''\text{N}$, $155^{\circ}33'57.19''\text{W}$ (347410.9 E, 6407691.0 N, Position # 70004). The Hydrographer believes this is the same rock and recommends charting it at the new position. *Concur*

The T-sheet rock at $57^{\circ}41'02.24''\text{N}$, $155^{\circ}34'19.02''\text{W}$ (346622.3 E, 6396434.7 N) was revised by the Hydrographer as a submerged reef foul with kelp. The approximate limits of the reef are defined by detached positions 22639, 21585, 21586, and 22640 at $57^{\circ}41'06.12''\text{N}$, $155^{\circ}34'26.23''\text{W}$ (346544.2 E, 6396558.5 N), $57^{\circ}41'04.26''\text{N}$, $155^{\circ}34'10.85''\text{W}$ (346796.7 E, 6396491.5 N), $57^{\circ}41'01.05''\text{N}$, $155^{\circ}34'13.40''\text{W}$ (346750.6 E, 6396394.0 N), and $57^{\circ}40'59.60''\text{N}$, $155^{\circ}34'21.87''\text{W}$ (346608.7 E, 6396354.5 N) respectively. The highest point of the reef is defined by the limits of hydrography. The reef was further developed with VBES using ten-meter line spacing to acquire soundings (Positions 54329-54715). *The reef was shown on smooth sheet based on the hydro data.*

Charted Feature Comparisons Chart 16575 (1st Ed.; April 15, 1988, Scale 1:80,000)

The charted submerged rock at $57^{\circ}39'44.14''\text{N}$, $155^{\circ}35'03.17''\text{W}$ (345836.0 E, 6394048.0 N, Position # 21584) was disproved using a 15-minute visual and echo-sounder search within a 60-meter search radius in water with four meter visibility. The average water depth was 16 meters. This area was also partially covered with SWMB. The Hydrographer recommends removing it from the chart. *Concur*

E. APPROVAL ✓

As Chief of Party, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; the Field Procedures Manual, and the NOS Hydrographic Surveys Specifications and Deliverables, as updated for 2000.

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

Survey H10977 is complete and adequate to supersede charted soundings and features in their common areas. There is no additional work required on this survey. *Concur with clarification. See End Rpt, Section M.*

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>
Data Acquisition and Processing Report for OPR-P164-RA-00	10/02/2000	N/CS34
Horizontal and Vertical Control Report for OPR-P164-RA-00	10/13/2000	N/CS34
Tides and Water Levels Package for OPR-P164-RA-00	07/05/2000	N/OPS1
Coast Pilot Report for OPR-P164-RA-00	11/01/2000	N/CS26

Approved and Forwarded:

Daniel R. Herlihy
Daniel R. Herlihy
Commander, NOAA
Commanding Officer

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

Survey Sheet Manager:

Shawna K. Bell
Shawna K. Bell
Ensign, NOAA

Field Operations Officer:

E. J. Van Den Ameerle
Edward J. Van Den Ameerle
Lieutenant, NOAA

GEOGRAPHIC NAMES

H-10977

Name on Survey

A ON CHART NO. 16575, 16580
B ON PREVIOUS SURVEY
C ON U.S. QUADRANGLE MAPS
D FROM LOCAL INFORMATION
E ON LOCAL MAPS
F P.C. GUIDE OR MAP
G RANDOMLY ATLAS
H U.S. LIGHT LIST
K

Name on Survey	A	B	C	D	E	F	G	H	K	
ALASKA (title)	X		X							1
ALASKA PENINSULA	X		X							2
CAPE AKLEK	X		X							3
DRY CREEK	X		X							4
HELEN CREEK	X		X							5
KATIE CREEK	X		X							6
PORTAGE CREEK	X		X							7
PUALE BAY	X		X							8
SHELIKOF STRAIT	X		X							9
TERESA CREEK	X		X							10
TRAIL CREEK	X		X							11
										12
										13
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										25

Approved: *[Signature]*

Chief Geographer

APR 3 2001



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 9, 2000

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P164-RA-2000
HYDROGRAPHIC SHEET: H-10977

LOCALITY: Southern Shelikof Strait, AK
TIME PERIOD: June 29 - July 25, 2000

TIDE STATION USED: 945-8209 Puale Bay, AK
Lat. 57° 42.5'N Lon. 155° 23.6'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.524 meters

TIDE STATION USED: 945-8471 Poltava Island, AK
Lat. 57° 0.8'N Lon. 156° 29.1'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.116 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SS47, SS48, SS49 & SS50.

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.

Note 2: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tide zone corrector files. For example, tide station one (TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

For

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final tide zone node point locations for OPR-P164-RA-2000,
Sheet H-10977.

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

	Tide Station Order	AVG Time Correction	Range Correction
Zone SS47	945-8209	-6	1.00
-154.877811 57.55126	945-8471	-6	1.15
-155.185527 57.651356			
-155.368609 57.716857			
-155.391457 57.70542			
-155.557485 57.637664			
-155.370117 57.582486			
-155.019952 57.48458			
-154.877811 57.55126			
Zone SS48	945-8209	0	1.00
-155.368609 57.716857	945-8471	+6	1.15
-155.379136 57.720616			
-155.41854 57.801366			
-155.62403 57.823666			
-155.651633 57.665358			
-155.557485 57.637664			
-155.391457 57.70542			
-155.368609 57.716857			
Zone SS49	945-8209	0	0.98
-155.557485 57.637664	945-8471	+6	1.13
-155.593205 57.62307			
-155.74879 57.545654			
-155.77949 57.61008			
-155.808242 57.673989			
-155.651633 57.665358			
-155.557485 57.637664			
Zone SS50	945-8209	-6	0.98
-155.019952 57.48458	945-8471	-6	1.13

-155.370117 57.582486
-155.557485 57.637664
-155.593205 57.62307
-155.74879 57.545654
-155.63577 57.49749
-155.30169 57.423084
-155.180794 57.399704
-155.12588 57.434875
-155.019952 57.48458

REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H10977

Survey Title: State: Alaska
 Locality: Shelikof Strait
 Sub-locality: Puale Bay

ADVANCE INFORMATION

Project Number: OPR-P164-RA-00

Survey Dates: June - July 2000

Depths are reduced to Mean Lower Low Water using verified tides.
Positions are based on the NAD83 horizontal datum.

CHARTS AFFECTED:

<u>Chart</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16575	1:80,000	1st	15 April 1988

DANGERS:

<u>Feature</u>	<u>Depth(fm)</u>	<u>Latitude</u>	<u>Longitude</u>
Sounding	0¾	57° 41' 34.885" N	155° 35' 47.105" W
Sounding	1¼	57° 41' 04.610" N	155° 34' 06.353" W
Sounding	1¾	57° 44' 16.861" N	155° 28' 05.954" W
Sounding	2½	57° 43' 56.361" N	155° 28' 38.407" W
Sounding	3¾	57° 44' 14.082" N	155° 28' 23.893" W
Sounding	4¼	57° 44' 04.575" N	155° 29' 31.800" W
Sounding	4¾	57° 40' 51.393" N	155° 28' 38.811" W
Sounding	8¼	57° 40' 20.033" N	155° 29' 45.629" W
Sounding	9¼	57° 40' 08.754" N	155° 34' 05.837" W
Sounding	9½	57° 45' 54.552" N	155° 34' 05.325" W
Sounding	9½	57° 45' 02.459" N	155° 32' 31.958" W
Sounding	9½	57° 44' 34.680" N	155° 30' 51.846" W
Sounding	9½	57° 44' 23.830" N	155° 31' 16.360" W
Sounding	9½	57° 44' 13.705" N	155° 31' 34.702" W
Sounding	9¾	57° 40' 28.569" N	155° 29' 20.372" W
Sounding	9¾	57° 39' 43.900" N	155° 34' 33.452" W
Sounding	9¾	57° 41' 24.229" N	155° 28' 24.398" W
Sounding	9¾	57° 41' 51.073" N	155° 33' 27.662" W
Sounding	9¾	57° 39' 42.783" N	155° 28' 15.443" W
Sounding	9¾	57° 44' 22.987" N	155° 30' 55.177" W
Sounding	10½	57° 39' 45.889" N	155° 28' 41.562" W
Sounding	10¾	57° 42' 22.605" N	155° 33' 18.548" W
<u>Feature</u>	<u>Depth(fm)</u>	<u>Latitude</u>	<u>Longitude</u>

REPORT OF DANGERS TO NAVIGATION

Feature	Depth(fm)	Latitude	Longitude
Sounding	10¾	57° 44' 04.352" N	155° 31' 51.692" W
Sounding	10¾	57° 44' 06.708" N	155° 33' 53.207" W

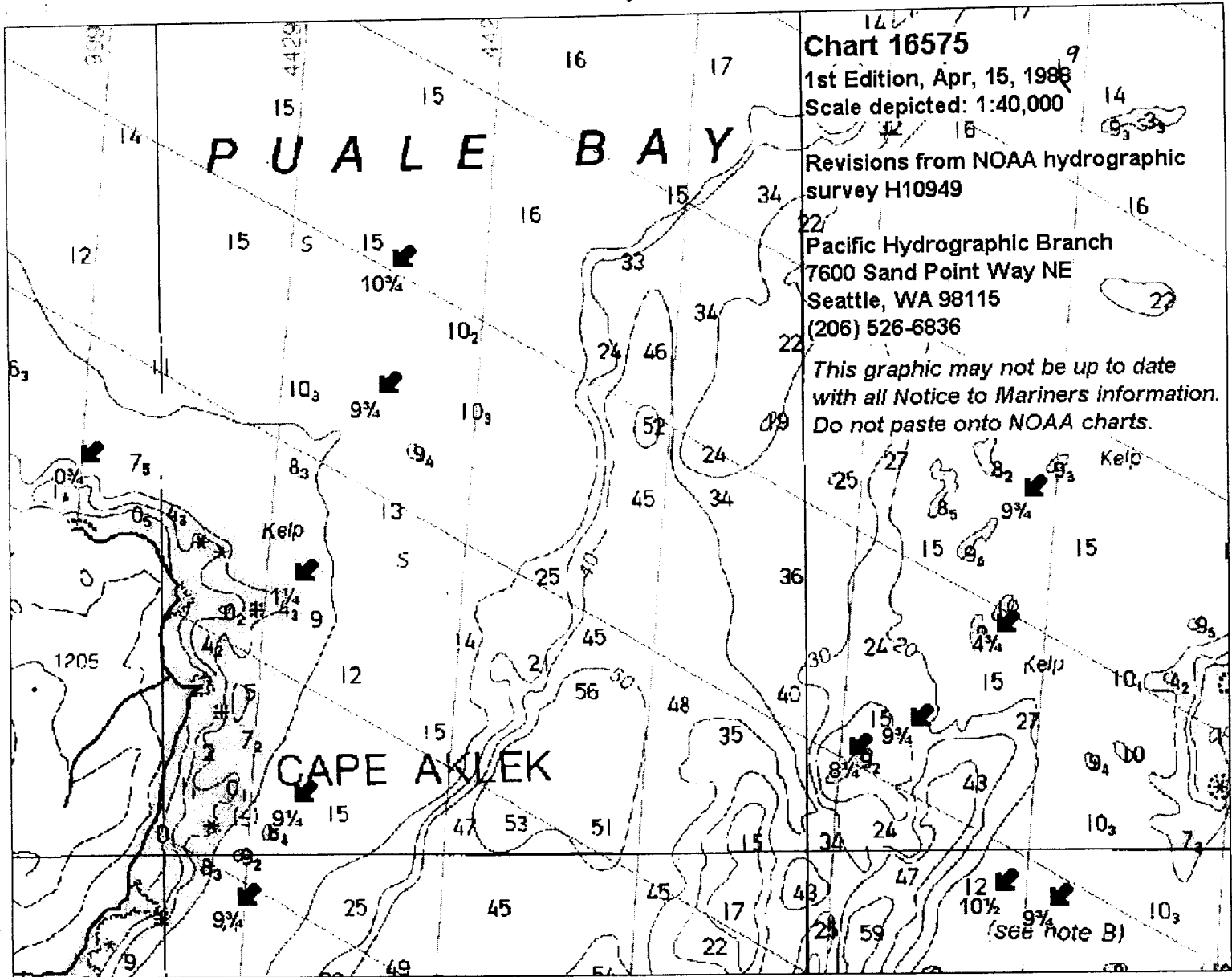
**ADVANCE
INFORMATION**

COMMENTS:

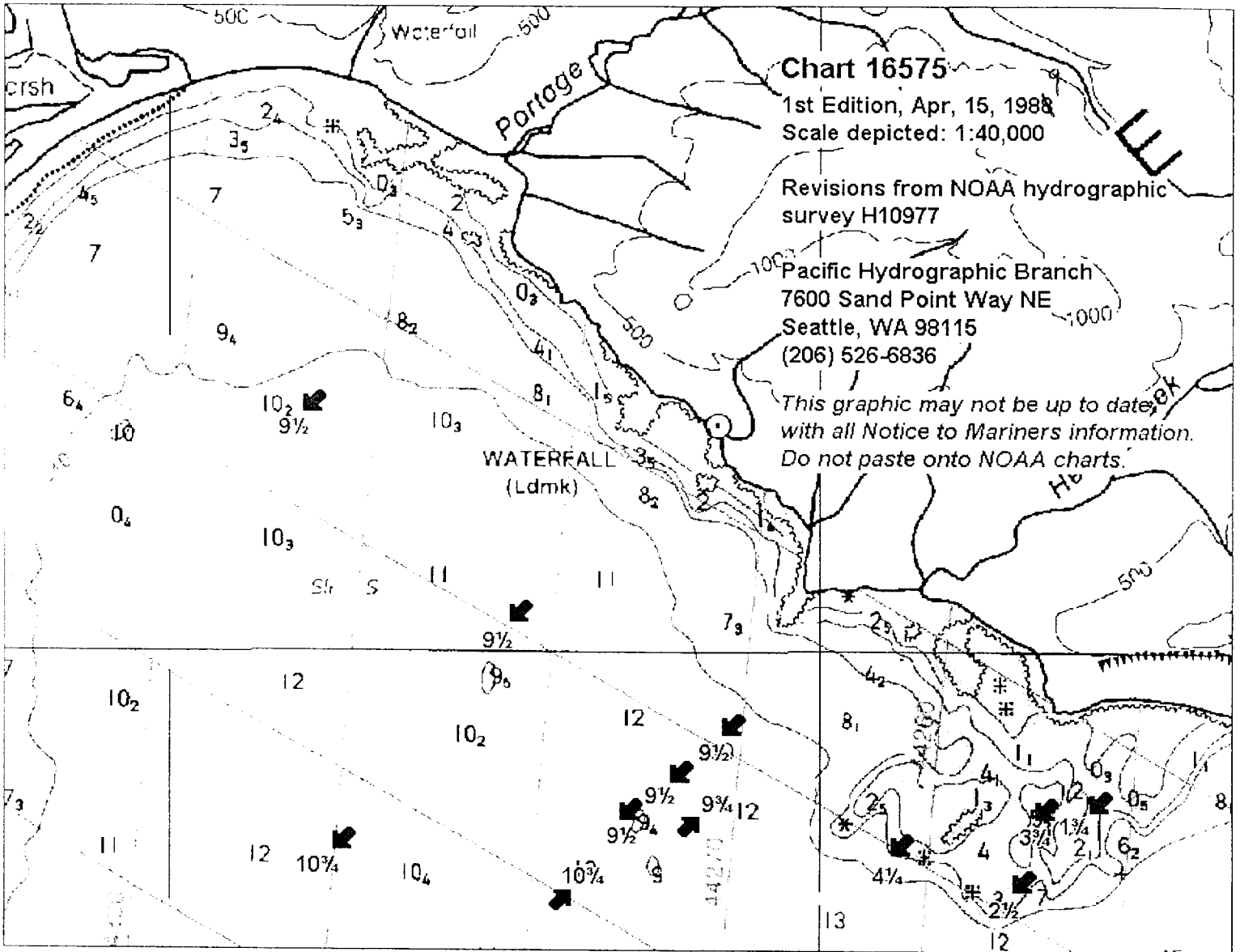
[To view chartlet 1 click here](#)

[To view chartlet 2 click here](#)

Questions concerning this report should be directed to the Pacific Hydrographic Branch (N/CS34) at (206) 526-6836.



ADVANCE
INFORMATION



HYDROGRAPHIC SURVEY STATISTICS

H-10977

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	NA
SCRIPTIVE REPORT		FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES	1				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA

SHORELINE MAPS (List):	TP=00622, TP-00625, TP-00626
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
NDINGS REVISED			
CONTROL STATIONS REVISED			
	TIME-HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET			114
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT			52
GEOGRAPHIC NAMES			
OTHER: (Chart Compilation)			37
USE OTHER SIDE OF FORM FOR REMARKS			
	TOTALS		203

Pre-processing Examination by	Beginning Date	03/18/2001	Ending Date	
Verification of Field Data by Davies, D. Doles, R. Mayor, L. Deodato	Time (Hours)	114	Ending Date	
ation Check by	Time (Hours)		Ending Date	
Evaluation and Analysis by L. Deodato	Time (Hours)	52	Ending Date	06/05/2001
Inspection by B. Olmstead	Time (Hours)	27	Ending Date	08/08/2001

EVALUATION REPORT H10977

A. PROJECT

Project information is adequately discussed in the hydrographer's report.

B. AREA SURVEYED

The survey area is adequately described in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line throughout the survey area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud, sand, and broken shell. Depths range from 0.2 to 64 fathoms.

C. SURVEY VESSELS

Survey vessels are adequately discussed in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The acquisition and processing of data in the field has been discussed in the hydrographer's report, section B.

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS), and Hydrographic Processing System (HPS) used by the hydrographer and MicroStation 95.

Processed digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by the Specifications and Deliverables, June 2000.

The data are plotted using a Universal Transverse Mercator, Zone 05 projection and are depicted on a single sheet.)

E. SONAR EQUIPMENT

Side scan sonar was not used during the survey.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate with verified tide correctors obtained from CO-OPS. The correctors are zoned direct from station 945-8209, Puale Bay, Alaska.

Other sounding reducers include corrections for static draft, dynamic draft, sound velocity, heave, roll, and pitch. These reducers have been reviewed and are consistent with NOS specifications.

H. CONTROL STATIONS

Horizontal control is adequately discussed in the hydrographer's report

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude: -2.550 seconds (-78.878 meters)
Longitude: 7.531 seconds (124.643 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 2.5 was specified in the Specifications and Deliverables.

During data collection satellite configuration, as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. During multibeam operations final positions are provided by the POS-MV that combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contained no significant errors.

Additional information concerning calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and corrections to position data.

J. SHORELINE

Shoreline maps TP-00622, TP-00625 and TP-00626 in raster format were office compiled on NAD27 and apply to this survey. The shoreline was digitized at the Pacific Hydrographic Branch on NAD83. Shoreline drawn on the smooth sheet in black originates from the above raster data as provided by the Remote Sensing Division, NGS. The shoreline data and the hydrographic data were merged during MicroStation processing. There were no MHW revisions on this survey.

The shoreline maps and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H10977 junctions with no other surveys. A comparison of the standard depth curves with the prior survey shows adequate agreement.

M. COMPARISON WITH PRIOR SURVEYS

The present survey was compared to the following prior surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H07195	1947	1:20,000	NAD27
H07196	1947	1:40,000	NAD27

Prior surveys H07195 and H07196 cover the entire area of the present survey. The present survey was compared to the digital raster copies of H07195 and H07196. The registration and legibility of these prior surveys to the present survey was good.

Except for the two shoaler soundings mentioned in the hydrographer's report, section D.6, sounding agreement is good. The present survey depths generally reflect a shoal bias from 0.3 to 1 fathom with both H07195 and H07196. Comparison of the standard depth curves with the prior surveys reflects little change in configuration. Additional information is found in the hydrographer's report sections D. 2 and D. 6.

The present survey was not able to adequately conduct hydrographic operations around several near shore areas of Puale Bay. In these areas, the evaluator has transferred several soundings and features in red from H07195 to the smooth sheet.

Except as mentioned above, survey H10977 is adequate to supersede the above prior surveys within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H10977 was compared with the following chart:

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
16575	1st	April 15, 1989	1:80,000

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys. The prior surveys have been adequately addressed in section M and requires no further discussion. Additional information is found in the hydrographer's report, section D. 2

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

Survey H10977 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Twenty- four dangers to navigation were discovered during survey operations, checked by Pacific Hydrographic Branch and reported to the N/CS26. No additional dangers to navigation were found during office processing. A copy of the report is attached.

P. ADEQUACY OF SURVEY

With the exception of the item mentioned below, hydrography contained on survey H10977 is adequate to:

- a. Delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. Reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. Show the survey was properly controlled and soundings are correctly plotted.

The hydrographer failed to make visual inspection as to whether the charted landmark (waterfall) at latitude 57°45'54"N, longitude 155°30'47"W still serves its intended purpose. The evaluator has transferred this feature to the smooth sheet from the prior survey.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, the Field Procedures Manual, April 1998 Edition, and the NOS Hydrographic Surveys Specifications and Deliverables, dated June 2000.

Q. AIDS TO NAVIGATION

There are no fixed and floating aids to navigation within the survey area.

The charted landmark (waterfall) at latitude 57°45'54"N, longitude 155°30'47"W should be retained as charted. There were no additional features of landmark value located within the area of this survey.

R. STATISTICS

This section in the hydrographer's report is no longer required under Specifications and Deliverables, June 2000.

S. MISCELLANEOUS

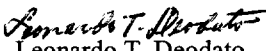
Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS

This is an adequate hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS


Referral to reports is adequately discussed in the hydrographer's report.


Leonardo T. Deodato
Cartographer


APPROVAL SHEET
H10977

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



_____ Date: 9-17-01
Dennis Hill
Chief, Cartographic Team
Pacific Hydrographic Branch

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


_____ Date: 9/26/01
John E. Lowell, Jr.
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval


Approved:


_____ Date: 12/4/02
Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

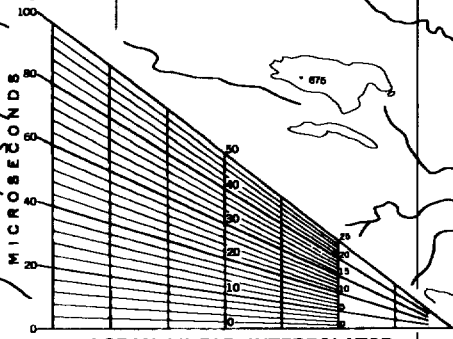
TIDAL INFORMATION

Name	Place (Lat/Long)	Height referred to datum of soundings (MLLW)			
		Mean High Water	Mean High Water	Mean Low Water	Extreme Low Water
Kotmal Bay	(58°00'N/154°59'W)	12.8	11.9	1.4	-6.0
Puale Bay	(57°42'N/156°22'W)	12.1	11.3	1.5	-4.6

ATTACHMENT 1
 H-10977 LIMITS DEPICTED ON CHART 16675
 1st EDITION, APRIL 15, 1989
 LIMIT LINE DENOTES AREA OF SUPERSESSION

 SUPERSEDED AREA OF CHART

NOT TO SCALE



LORAN LINEAR INTERPOLATOR

LORAN-C
 GENERAL EXPLANATION

LORAN-C FREQUENCY 100kHz.
 PULSE REPETITION INTERVAL
 9900 99,900 Microseconds
 STATION TYPE DESIGNATORS: (Not individual station letter designators).
 M Master
 W Secondary
 X Secondary
 Y Secondary
 Z Secondary
 EXAMPLE: 9990-Y

RATES ON THIS CHART

The Loran-C lines of position overprinted on this chart have been prepared for use with ground wave signals and are presently compensated only for theoretical propagation delays which have not yet been verified by observed data. Mariners are cautioned not to rely entirely on the lattices in inshore waters. Skywave corrections are not provided.

