10249

Diagram No. 8802-3

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-20-3-87

Registery No. ... H-10249

LOCALITY

State ... Alaska

General Locality ... Togiak Bay

Sublocality ... Head of Togiak Bay

1987

CHIEF OF PARTY
CAPT C.W. Fisher

LIBRARY & ARCHIVES

DATE ... September 19, 1988

☆U.S. GOV. PRINTING OFFICE: 1985—566-054

10249

"GP"

100 — 16315
1,023 — 16011
1,534 — 16006

CARTO 6
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NOAA FORM 77-28
(11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-10249

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 20-3-87

State: Alaska

General locality: Togiak Bay

Locality: Head of Togiak Bay

Scale: 1:20,000 Date of survey: July 14 - August 12, 1987

Instructions dated: March 6, 1987 Project No.: OPR-R184-RA-87

Vessel: RAINIER S221 (2120); Launches 2123, 2124, 2125, 2126; Skiff 2129

Chief of party: Carl W. Fisher, CAPT., NOAA

Surveyed by: CAPT Fisher, LT White, ENS Damm, ENS O'Mara, ENS Hill, ENS Meis, ENS Larsen

Soundings taken by echo sounder, ~~hand lead, pole~~: DSF-6000N

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by ~~Protracted by~~: Gordon E. Kay Automated plot by: PMC Xynetics Plotter

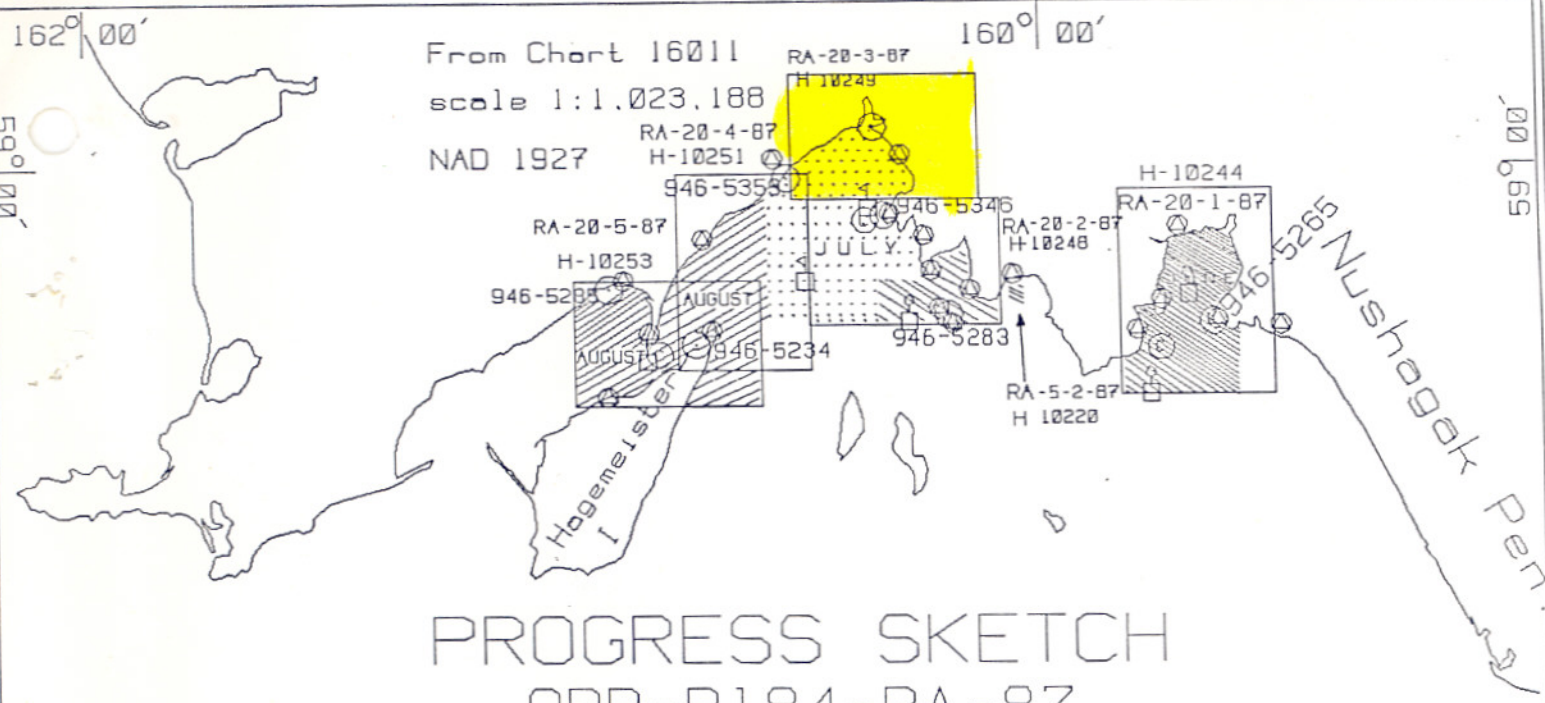
Verification by: Richard Shipley

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW

REMARKS: Marginal notes in black generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

SC 3-25-97 ✓ AWOIS and SURF 4/89 RWD

☆ U.S. GOVERNMENT PRINTING OFFICE: 1978-665-010-1174



PROGRESS SKETCH

OPR-R184-RA-87

HYDROGRAPHIC SURVEY

TOGIAK BAY, ALASKA

JUNE 7 - SEPT. 01

NOAA SHIP RAINIER

CARL W. FISHER, CAPT. NOAA

COMMANDING

JUN	JUL	AUG	SEP	
81.4	122.7	94.88	-	SQ.N.M. Sounding
1108	1565	1961	-	L.N.M. Sounding
460	988	1015	10	L.N.M. Misc. Distance
78	65	119	1	Bottom Samples (Grab)
10	8	5	-	Electronic Control Stations
4	--	-	-	Temp. Depth. Sound Velocity
—	3	2	-	Nansen Cast
4	2	1	-	Tide Gages
15	11	5	-	Geodetic Control Stations
3	18	17	-	Water Samples Analyzed
1.65	2.97	2.42	-	SQ. N.M. Side Scan Sonar
82	15.4	76.4	-	L.N.M. Side Scan Sonar
1	1	2	-	Current Stations Occupied

Table of Contents

Descriptive Report to Accompany Hydrographic Survey H-10249

Field Number RA-20-3-87
Scale 1:20,000
1987

NOAA Ship RAINIER
Chief of Party: Captain Carl W. Fisher

A. Project

A basic hydrographic survey of the head of Togiak Bay was completed as specified by Project Instructions OPR-R184-RA, dated March 6, 1987, Change Number 1, dated March 20, 1987, and Change Number 2, dated June 2, 1987, Change Number 3, dated August 10, 1987

This survey was one of a series of surveys in a project to provide modern hydrographic survey coverage of Bristol Bay, Alaska, between Cape Newenham and Cape Constantine, for existing and new preliminary charts that are planned for the area. This project responds to requests from the Alaska congressional delegation, U.S. Coast Guard, State of Alaska, Bristol Bay Native Association, Togiak Fishing Fleet, and other commercial fishermen.

The survey was designated sheet J on the original sheet layout for the project dated January 25, 1985. The field number for the survey was RA-20-3-87 and the assigned registry number was H-10249.

B. Area Surveyed

The survey was located in northeast Bristol Bay, Alaska, at the head of Togiak Bay. Togiak Bay is an embayment in the coastline of the southwest Alaska mainland, 11 nautical miles long (north - south) and 22 nautical miles wide (east - west) at the mouth of the bay. The actual survey area encompassed all waters north of latitude 58° 58' 00" N. The survey area was bounded by the mainland to the north, east, and west. The shoreline of Togiak Bay consists mainly of sandy beaches with sand and rock bluffs of various heights leading up to tundra covered headlands. There are numerous streams and small rivers leading into the bay, as well as an extensive system of marshes where the Togiak River enters at the extreme northern end of the bay.

The bottom throughout the survey area was found to be very gently sloped. Only near the southern limit of the survey area (on both the east and west sides) does one encounter an irregular, rocky bottom near the shoreline. The shallowest soundings, which reduced to 0.7 fathom above MLLW, were found on the north portion of the sheet at the head of the bay and along the northwest shore. At MLLW a considerable portion of the bay goes dry leaving extensive mud flats. The deepest depths in the survey area, 4.0 fathoms, were observed near the southeast edge of the sheet . The bottom sediments in Togiak Bay were dominated by fine green sand and mud, with occasional shell, stone, or gravel.

Togiak Bay is a major fishing ground for the local fleet from the towns of Togiak and Twin Hills, located at the head of the bay. During the course of the survey the sockeye (red) salmon were running and the fishermen were out in full force. The high numbers of flat bottomed fishing boats and gill nets in the survey area created an obstacle course for the survey launches.

There is a small anchorage for the local fleet directly to the north of the dock located at Togiak Fisheries Inc. of Twin Hills at the northeast head of the bay. A small channel exists through the extensive mud flat at the head of the bay. This channel allows vessels to gain access to Togiak Fisheries Inc. at times other than high water. The channel is narrow and, due to its current-gouged nature, constantly changing. The channel is generally one fathom deeper than the surrounding water. The local mariners, when asked about the channel, say to head for the red barn until you are three quarters of a mile from shore, then turn right and head for Togiak Fisheries.

Data acquisition was conducted from July 14 through August 12, 1987 (DN 195 - DN 224).

C. Sounding Vessels

All data were acquired from the ship's four automated survey launches, and one skiff.

Vessel	EDP No.	Operation
RA-3	2123	R/R
RA-4	2124	R/R, Shoreline Verification
RA-5	2125	Bottom samples
RA-6	2126	R/R
RA-9	2129	Shoreline Verification

No changes to the standard sounding configurations were necessary. Launch RA-5 was used solely for bottom samples and not employed for sounding lines. An aluminum hulled skiff, RA-9, was used for low water shoreline verification on day 220. No soundings were taken by this vessel.

D. Sounding Equipment and Corrections to Echo Soundings

The automated survey launches used for this survey were equipped with Raytheon DSF-6000N echo sounders. The echo sounders were operated in the HIGH + LOW (HIGH DIGITIZED) function, using manual gain controls on both high and low frequencies to obtain the best analog trace. Soundings were recorded in fathoms and tenths of fathoms. Two-fathom bar checks were conducted and recorded daily, using both the LOW and the HIGH + LOW (HIGH DIGITIZED) functions, in accordance with the Provisional Instructions "RAYTHEON DSF-6000N ECHO-SOUNDER OPERATING AND PROCESSING INSTRUCTIONS," dated July 5, 1983, and the N/CG2 memorandum "DSF-6000N Depth Errors as a Function of Receiver Gain," dated May 23, 1986. The echo sounders were assigned to the vessels as shown in Table 1.

The echo sounders functioned properly throughout the project with only one exception. The instrument in vessel 2124 (S/N A114N) was having problems making a clear trace and was replaced by S/N A103N for day 197 only (Table 1). The trace for the previous day was acceptable, thus the malfunction did not effect the sounding data.

Table 1. Raytheon DSF-6000N Echo Sounders

Vessel	Serial Number	Day Numbers
2123	A117N	195-224
2124	A114N	195-196,198-224
	A103N	197
2125	A103N	210
2126	A119N	195-224

Corrections to Echo Soundings

Corrections to all soundings were determined for sea conditions, draft, velocity of sound through water, settlement and squat, and tides. These correctors are eventually to be applied to all survey vessels and all areas of this survey. However, in plotting the final field sheet, the determined correctors were applied for sea conditions, velocity, and draft only. Settlement and squat correctors were not applied. Predicted tide correctors were used in lieu of field-determined correctors, and the field tide records have been forwarded to N/OMA121, in accordance with

Hydrographic Survey Guideline #50 and the PMC OPORDER. Variations in the instrument initial, stylus arm length, and belt tension are not present with the DSF-6000N.

Sea Conditions

Corrections for sea conditions were applied while scanning. The scanning technique used in comparing the analog trace with the digital record was chosen to eliminate fluctuations greater than 0.2 fathoms resulting from sea action, while at the same time preserving the trend of this gently sloping area.

Draft

Transducer depths of 0.3 fathom were measured for all four launches on March 26, 1987, by divers using a large wooden T-square. The draft measurements were made at PMC with the fuel tanks all between full and half full, and with zero, then four, people aboard. The average transducer depth of 0.3 fathom agrees with RAINIER historical records. Transducers are mounted starboard, midships, in a location such that all sounding corrections apply to both the low- and high-frequency echo-sounder signals.

Velocity Correctors

Velocity of sound through water and the associated corrections to echo soundings were determined by two Nansen casts. On day 211 a Nansen cast (cast #7) was performed to a depth of 10 meters at a location off Anchor Point (Table 2), near the southeastern edge of the survey area. On day 212 another Nansen cast (cast #8) was performed near the southwestern edge of the sheet to test if there was unequal mixing of water in the head of Togiak Bay, as there is a large source of fresh water in the northern portion of the bay. The velocity correctors used in this survey were determined by taking a mean of the two Nansen casts. Velocity tape #3, showing a corrector of 0.1 fm starting at a depth of 3.8 fm, was used on the final smooth plot for this survey (Appendix IV).

Table 2. Velocity Cast Locations

Cast No.	Deepest Depth (m)	Day Number	Geographic Position
7	10	211	58°57.0'N, 160°20.7'W
8	15	212	58°54.6'N, 160°30.3'W

The Nansen cast provides data only at discreet, preselected depths, rather than continuously throughout the water column. Therefore, the method used to compute velocity correctors is similar to that outlined in the Hydrographic Manual Fourth Edition as Example 2 on page 4-77 (Appendix IV).

Settlement and Squat

Settlement and squat correctors were determined for the automated survey launches in Seymour Canal on April 28 and May 5, 1987, over hard bottom in a depth well exceeding seven times the vessels' drafts. Both sea and wind were calm. Observations were made through a Zeiss Ni2 leveling instrument (S/N 87102) to a rod held vertically on deck of each launch, almost directly over the transducer. Five level readings were made at each speed tested, and the average taken, to compute the correctors. Tide staff readings were taken concurrently with each set of level readings, and all tide height differences were normalized to the tide height of the dead-in-the-water level readings before the correctors were computed.

Soundings on the final field sheet are not corrected for settlement and squat, although corrections of 0.1 fathom must be made for certain vessels at some RPMs. TC/TI tapes for each automated sounding vessel have been prepared and submitted with this survey. Records of settlement and squat data are included in Appendix IV.

Tide Correctors

The final field sheet is plotted using predicted tide correctors provided by the Project Instructions (Table 3). These correctors apply to predicted tides for Black Rock, Walrus Islands, Alaska (946-5182), provided by the Sea and Lake Levels Branch (see Appendix XIII).

Tide stations were established at Summit Island (946-5283), East Togiak Bay (946-5346), and West Togiak Bay (946-5359).

A three-day tide gage was also established at the Togiak Fisheries, Inc. pier at the northernmost point of the bay to permit analysis of the tidal action at the head of the bay.

Field tide records have been submitted (see Field Tide Notes in Appendix II) and a request for approved tides made (Appendix XI).

Table 3. Tide Correctors

Applicable Area	Time Correcton High Water	Time Correcton Low Water	Height Ratio
Entire Sheet	+ 30 min	+ 30 min	x1.06

E. Hydrographic Sheets

The field sheets were all prepared aboard RAINIER, on a Houston Instrument Complot DP-3 roll plotter, using the PDP-8/e Hydroplot system and program RK201, "Grid, Signal, Lattice Plot". Program RK201 draws a modified transverse mercator projection. The final field sheet, a 1:20,000-scale projection, was plotted on two plotter sheets designated RA-20-3N-87 and RA-20-3S-87.

One expansion sheet at 1:5,000 scale was used to plot the only special investigation conducted during the survey and is included with the survey data. The expansion sheet (#1) displays 25m and 50m splits in an area near the southwest corner of the survey area. This development is the investigation of AWOIS item number 50934 which encompasses an islet and the associated foul area surrounding it:

Sheet	Survey Area	Boundaries
Expansion #1	AWOIS 50934 foul area (25m & 50m splits)	North - 59° 00' 40" N South - 58° 59' 15" N East - 160° 28' 00" W West - 160° 33' 15" W

Least depths from this expansion sheet have been transferred to the final field sheet. The central meridian, false easting, and controlling latitude were held constant on all field sheets (Appendix I).

Depth contours are drawn on the final field sheet in accordance with the Hydrographic Manual.

Depth Contour(fm)	Color
0	Orange
1	Green
2	Red
3	Blue
~~4~~ 5	Orange

The final field sheet and accompanying field records, along with this Descriptive Report, are being forwarded to the Pacific Marine Center for verification.

F. Control Stations

Four geodetic stations were used to control this survey. The position for NEMESIS is from the NGS data base. BLAKE, QUIG, and TOG were positioned during this survey and their positions are unadjusted field positions.

Station	Order, class	Date established	Signal No.
BLAKE Field Position	31	1987	122
NEMESIS	11	1948	223
* QUIG	31	1987	226
* TOG	31	1987	121

*Located off of Sheet limits

Four other geodetic stations, not used directly for control during this survey, were used to position the new stations.

Station	Order, class	Date established
OWENS	11	1948
STRAIT	21	1948
SUMMIT AZ	11	1948
VELO	31	1985

Positions for OWENS, STRAIT, and SUMMIT AZ are from the NGS data base. Information for VELO was provided by NOS/PMC Pacific Photo Party as an unadjusted field position.

NEMESIS, OWENS, and SUMMIT AZ were verified with check angles during horizontal control field work. TOG was located by triangulation from OWENS and SUMMIT AZ. BLAKE was located by triangulation from TOG and NEMESIS. QUIG was located by triangulation from VELO and STRAIT. VELO and STRAIT were verified with a check distance and check angle, respectively, during horizontal control field work.

All stations met third-order, class I standards for positioning. Further information can be found in the Horizontal Control Report, OPR-R184-RA-87.

Geographic positions were based on the North American Datum of 1927 and Clark Ellipsoid of 1866. See Evaluation Report Section 2

G. Hydrographic Position Control

Soundings were located using only range-range geometry. Range data were acquired with Motorola's Mini-Ranger III electronic positioning system. Refer to Electronic Control Report OPR-R184-RA-87 for details of 1987 field season calibration results.

Positioning Equipment

Four Mini-Ranger console/RT pairs were used during this survey; each pair remained with an assigned vessel for the survey's duration. The following table lists the days of use and corresponding vessel for each console/RT pair.

Console/RT pair	DN	EDP #	Vessel Name
720/B1405	195-224	2123	RA-3
30269/C1712	195-224	2124	RA-4
715/H3705	195-224	2125	RA-5
711/B1388	195-224	2126	RA-6

The following six shore transponders were used to locate the vessels:

Code	Serial Number
A	G3510
C	G3500
E	F3256
F	G3501
0	C1789
1	C1883

Calibrations and System Checks

Opening baseline calibrations for the console/RT pairs and transponders were conducted in accordance with PMC OPORDER 3.3 at the following locations on the corresponding dates:

Console/RT Pair	Location	Date	Codes
720/B1405	Sitka, AK	17 May 87	A-3
30269/C1712	Sitka, AK	19 May 87	A-3
711/B1388	Summit Is, Ak	20 Jun 87	A-3
715/H3705	Dutch Harbor, AK	01 Jul 87	A,D-0,3
715/H3705	Summit Is, AK	18 Jul 87	1,2
715/H3705	Dutch Harbor, AK	14 Aug 87	C

The calibrations were conducted over open water with the following ranges:

Calibration Site	Baseline Distance
Sitka, AK	1910 meters
Summit Is, AK	810 meters
Dutch Harbor, AK	1215 meters

From these calibrations, signal strength cutoffs and opening baseline correctors were developed; see Appendix V for a summary of baseline correctors and signal strength cutoffs.

Critical system checks were conducted at least once per week using the theodolite intersection method. Non-critical system checks were performed daily. All system checks were performed in accordance with PMC OPORDER 3.3. Throughout the survey, system checks agreed within ten meters of the opening baseline correctors.

The final field sheet plotted aboard the RAINIER was plotted using the initial baseline correctors. A waiver of bi-monthly baseline calibrations was issued on March 23, 1987 (see Appendix V). Final baseline calibrations are to be conducted upon the RAINIER's return to Seattle in September, 1987. It is recommended that the means of the opening and closing correctors be used in plotting the smooth sheet. BASELINE CORRECTORS WERE AVERGED AND USED TO PLOT the SMOOTH SHEET.

A complete discussion of the electronic control for this project, including baseline calibrations and summaries of system checks may be found in Electronic Control Report OPR-R184-RA-87.

Problems and Unusual Position Configurations

No significant problems were encountered concerning the electronic control used for this survey.

Null zones and low signal strengths were observed throughout the survey. Positions within null zones were interpolated by time and course if the zones were smaller than 5

centimeters. Ranges with signal strengths 1 unit less than the cut off were recorded. The low signal strengths seemed to be associated with null zones. Positions computed from these ranges were retained as long as they plotted in agreement with dead reckoning.

Antenna Offest Distances (ANDIST)

Each launch's RT antenna unit was located directly over the fathometer's transducer; hence, all ANDIST values were 0,0.

H. Shoreline

See Eval. Report, section 6

Shoreline features on the field sheet were transferred from three NOS shoreline manuscripts:

1. NATIONAL OCEAN SERVICE
SHORELINE MANUSCRIPT
TP-01186
ALASKA
TOGIAK BAY TO
CAPE CONSTANTINE / SUMMIT ISLAND
SCALE 1:20,000
TRANSVERSE MERCATOR PROJECTION
10,000 FOOT GRID BASED ON
ALASKA STATE PLANE COORDINATE SYSTEM
ZONE 6
1927 NORTH AMERICAN DATUM

2. NATIONAL OCEAN SERVICE
SHORELINE MANUSCRIPT
TP-01176
ALASKA
TOGIAK BAY TO
CAPE CONSTANTINE
SCALE 1:20,000
TRANSVERSE MERCATOR PROJECTION
10,000 FOOT GRID BASED ON
ALASKA STATE PLANE COORDINATE SYSTEM
ZONE 6
1927 NORTH AMERICAN DATUM

3. NATIONAL OCEAN SERVICE
SHORELINE MANUSCRIPT
TP-01178
ALASKA
CAPE NEWENHAM TO
TOGIAK BAY
SCALE 1:20,000
TRANSVERSE MERCATOR PROJECTION
10,000 FOOT GRID BASED ON
ALASKA STATE PLANE COORDINATE SYSTEM
ZONE 7
1927 NORTH AMERICAN DATUM

Shoreline details were verified by visual inspection either at low tide from a skiff (vessel 2129), or at various stages of tide from a launch (vessel 2124). Much of the shoreline verification was impossible at low stages of tide due to the fact that a large portion of the bay was above MLLW, with a gently sloping mud bottom. There were no areas where verification was not accomplished. However, shallow water at the northern end of the bay in the area of the Togiak River mouth prohibited safe entry and caused shoreline verification of that area to be accomplished at a greater than normal distance.

Features which appeared as depicted on the TP-sheet were assigned reference numbers and heights as directed in PMC OPORDER 3.6. The reference numbers were recorded with heights in a sounding volume and on a paper copy of the TP-sheet. Descriptive annotations were recorded on the TP-sheet and occasionally supplied on the raw data printouts at the inshore terminations of sounding lines and throughout lines run along the shore. The paper copy of the TP-sheet contains notes about topography behind the high water line over the entire area. Significant descriptions have been transferred to the final field sheet.

The location of significant offshore features, and additional features not shown on the TP-sheet, were recorded as detached positions on the raw data printouts. Cartographic codes have been assigned in the field records.

Shoreline details and features have been transferred to the field sheet with additions shown in black and changes shown in red. Detached positions were plotted on the final field sheet with their four-digit position numbers. Reference positions were plotted with their three-digit numbers, preceded by an 'R'. Heights were given in feet and have been corrected for predicted tides. Heights given for ledges, reefs, rocks, and islets refer to the highest portion of each feature. Sounding lines were run alongshore by launch, at or near high water, and these lines

occasionally passed over ledges resulting in negative soundings. These heights have been retained in the records to confirm that the ledges are exposed at MLLW.

Manuscript Inadequacy

One inadequacy was evident in the shoreline manuscripts. The hydrographer believes that somehow the photogrammetrist overlooked incorporating a shallow area delimitation line on TP-01176. This shallow area is contiguous with the one present on TP-01178. TP-01176 was revised employing the aerial photograph, which showed a definite mud line extending up the coast. Mainscheme hydrography in the area shows a correlation between the shallow area delimitation line that was added to TP-01176 and the MLLW line.

Additions

It was clearly evident during the field work that the photography for the three TP-sheets was flown during a stage of tide higher than MLLW, possibly as high as mid-tide. The majority of shoreline features depicted on the TP-sheets were isolated rocks and groups of rocks surrounded by a foul area delimitation. Field work performed at periods of low water proved most of the rocks, and foul area groups of rocks, to be ledges or reefs exposed at MLLW. On the final field sheet, wherever an isolated rock, or group of rocks, from the TP-sheet was found to be a ledge or reef, the feature is shown in black representing an addition to the manuscript. The TP-sheet rock symbols have been retained with a height or average height for the point or points on the ledge to which they correspond.

In one instance, isolated rocks on the southeast shoreline were found to be a foul area group of rocks and are delimited with a black dashed line representing an addition to the manuscript. Three rocks were located with detached positions along this foul area delimitation line:

Plotted on Smooth Sheet

1. Rock 5.4 feet above MLLW, Carto Code 291
   D.P. 4624, DN 211/2043Z
   58° 58' 25.86"N
   160° 17' 38.16"W
   *(5)

2. Rock 4.9 feet above MLLW, Carto Code 291
   D.P. 4625, DN 211/2049Z
   58° 58' 31.33N
   160° 17'36.76W
   *(5)

3. Rock 6.4 feet above MLLW, Carto Code 291
   D.P.4626, DN 211/2056Z
   58° 58' 40.29"N
   160° 17' 16.26"W
   *(6)

Disprovals

Two TP-01178 features were not seen at the locations given below and are considered disproved. It was not low water when these positions were taken, therefore, on day 220 a low water visual investigation was conducted again disproving the existence of the rocks (see R-128). They are not shown on the final field sheet.

1. Rock — Fix 4628, DN 211/2348Z, 58° 59' 52.8~~5~~"N, 160° 30' 18.34"W — a depth of 1.7 fathoms is shown on Smooth Sheet

2. Rock — Fix 4635, DN 212/0018Z, 58° 59' 50.3~~5~~"N, 160° 30' 27.58"W — a depth of -0.6 fathoms is shown on Smooth Sheet

Prior Photogrammetric Survey See Eval. Report, section 6

TP-01178 and TP-01176 included 8 shoreline features in question that originated from historical photographs. The features were not shown by positions, but were presented as circled areas vaguely outlining the features from prior maps. These items originated from U.S. Coast and Geodetic Survey Topographic Maps (1:20,000 scale polyconic projection, 1927 NAD) compiled in 1951 from aerial photographs taken in October, 1946, and August, 1950:

Map Number	Number of Features Transferred to TP-01188
T-9230	5
T-9231	2
T-9236	1

T-9230, T-9231, and T-9236 were not supplied for comparison during this survey.

These features were investigated during shoreline verification and their status determined as follows:

Feature Location	Verification Position Number	Status
59° 00.7' N (35.10") 160° 30.9' W (04.15")	D.P.4823	Rocks found to be inshore of D.P.4823. Shallow water made it impossible to position inshore rocks accurately. Positions depicted on TP-01178 (from T-9230) agree with visual inspection. These rocks are above MLLW.
59° 00.1' N (07.34") 160° 31.4' W (16.65")	R-116 D.P.4627	Nine TP-01178 rocks found to be a reef with highest point 5.6 feet above MLLW. D.P.4627 positions outermost point of the reef.
58° 59.8' N (45") 160° 30.5' W (30")	D.P.4631 D.P.4632 D.P.4633 D.P.4634	TP-01178 islet found to be much larger than on T-sheet. The four D.P.'s position the outer boundary of the islet.
59° 01.4' N (27") 160° 28.6' W (32")	R-126	Stream and shoreline appear as on TP-01176. Associated shallow area depicted by mainscheme hydrography.
59° 04.3' N (18") 160° 21.0' W (00")	R-123 R-124	Visual inspection of shoreline agrees well with shoreline on TP-01176. Shallow water prohibited more thorough investigation.
59° 04.3' N (18") 160° 19.5' W (30")	R-123 R-122	Visual inspection of shoreline agrees well with shoreline on TP-01176. Shallow water prohibited more thorough invetsigation.
59° 03.4' N (24") 160° 19.7' W (45") APPROX.	D.P.4552	Visual inspection of shoreline agrees well with shoreline on TP-01176. D.P.4552 positions the northeast corner of the small Togiak Fisheries Inc. wharf, which is not shown on the TP-sheet.
59° 03.2' N (04.02") 160° 20.4' W (23.65")	D.P.4632	D.P.46~~32~~36 demonstrates a search of the correct area. No islet is present. Mainscheme hydrographic records also show no indication of an islet in the area.

see EVALUATION REPORT section 4.

The above referenced features have been transferred to the final field sheet at their estimated positions. The hydrographer recommends that the prior photogrammetric surveys be used to position the features that were observed and referenced, but not located with detached positions due to extremely shallow approaches.

Control Stations Seaward of the Shoreline

There were no control stations located seaward of the shoreline during this survey.

I. Crosslines

A total of 54.8 nautical miles of crosslines were run, representing 12.9% of the mainscheme hydrography. The high percentage of crosslines includes a series of short crosslines run to confirm the one-and two-fathom curves, which paralleled mainscheme hydrography. The crossline soundings generally agreed with mainscheme soundings to within three tenths of a fathom. A sample of 100 comparisons was made across the sheet.

Crossline/Mainscheme Agreement	
Within 0.1 fathom	62%
Within 0.2 fathom	88%
Within 0.3 fathom	99%

A closer examination of the crosslines and mainscheme lines revealed a few crossline soundings to be 0.4 to 0.5 fathoms deeper than the associated mainscheme soundings. These discrepancies occur between fixes 8543 and 8548 in the shallow water along the western shore near latitude 59° 01' 00"N. These crossline discrepancies are probably due to a combination of factors. A week elapsed between the times the crossline and mainscheme data were aquired. Differences between the predicted tide used to reduce these data and the real tide could have been especially pronounced because of the extremely shallow bathymetry in combination with meteorological effects, such as storm surges. In addition, heavy siltation was observed in the area (see Section P) and the stormy conditions during this period could have caused a considerable amount of sediment to be shifted. Agreement between mainscheme and crossline soundings was evaluated to be very good throughout the rest of the survey.

J. Junctions

This survey junctions with two contemporary surveys, H-10248, along the southern edge of the sheet, and H-10251, along the extreme southwest edge of the sheet. H-10248 and H-10251 are 1:20,000 scale surveys conducted concurrently with this survey. Data aquisition was continuous throughout the three sheets. No irregularities were found with soundings or depth contours when comparing adjacent sheets. Agreement of overlapping soundings between sheets was considered very good.

The following data demonstrates the agreement found between soundings on adjacent sheets from a sample of 20 overlapping soundings:

Sounding Agreement	
Within 0.1 fathom	75%
Within 0.2 fathom	95%
Within 0.3 fathom	100%

K. Comparison With Prior Surveys

There were no prior surveys that covered the area of this contemporary survey.

L. Comparison With the Chart

This survey was compared to the following charts:

Chart Number	Scale	Edition	Date
16006	1:1,534,076	29th	8/23/86
16011	1:1,023,000	31st	6/29/85
16315	1:100,000	3rd	2/28/87

Danger to Navigation Reports

No danger to navigation reports were filed concerning this survey.

Comparison of Sounding Features

Since chart 16315 was the largest scale chart covering the area, it was most appropriate to use for the comparison.

There was one charted sounding within the limits of the survey. The markup of chart 16315 shows the sounding originating from BP 18063, 1916. That blueprint was not made available for comparison with this survey. A comparison was made for the one sounding, as shown below, and agreement was found to be good.

Charted Sounding	Geographic Position	H-10249 Sounding
1.0 fm	58°59.9'N (59.6") 160°22.5'W (30")	1.7 fm

Due to the extensive coverage of soundings obtained in this survey, it is recommended that the survey depths supersede the charted depth in the survey area. CONCUR

AWOIS 50936

History: T9230/47 - shoal area; at Head of Togiak Bay running in E-W direction at lat 59°02'50"N long 160°20'30"W (6/85).
T9231/47 - same as above (entered 6/85 RWD).
TP01176/83 - reviewed, class III, NTH; shoaling verified in lat 59°02'50"N, long 160°20'30' in E-W direction

Survey requirements: full - verify extent of LWL

The following set of survey data describes the area:

Day Number	Vessel Number	Fix Numbers	Type
200	2124	4143 - 4150	Crossline
		4167 - 4180	Crossline
		4181 - 4208	Mainscheme
202	2124	4213 - 4318	Mainscheme
210	2124	4475 - 4480	Crossline
		4481 - 4523	Mainscheme
211	2124	4545 - 4578	Mainscheme
212	2124	4637 - 4639	Mainscheme

Mainscheme hydrography showed the area to be above the zero fathom curve with depths ranging from -0.1 to -0.7 fathom. The entire head of the bay to the north of the defining latitude (59°02'50"N) was found to be above the low water line, with the exception of a small channel. The low water line being well south of the defining latitude suggests the aerial photography was flown at a level of tide considerably higher than MLLW.

The channel heads north~~west~~ EAST from 59°02'00"N and 160°23'30"W and leads to a small anchorage and dock due north of Togiak Fisheries, Incorperated at 59°03'24"N and 160°19'48"W. The

small anchorage is used primarily by the Togiak fishing fleet of flat bottomed vessels.

The expansive, shallow area comprising the head of the bay allowed work in the northern portion of the sheet only during the highest tides. More than once it was necessary to sit in the mud and wait for the next high tide. The bottom was shown to be flat and featureless, excluding the small channel mentioned in the previous paragraph. It is recommended that the shallow area currently charted be revised to reflect the hydrography from this survey. CONCUR

The islets charted at the following positions do not exist:

59°03.0'N	59°03.2'N
160°20.6'W	160°20.2'W

The entire area was covered by the mainscheme hydrography listed above. It is recommended the islets be deleted. CONCUR

Comparison of Non-Sounding Features

Most charted non-sounding features were alongshore and were investigated during shoreline verification (see Section H). It is recommended that the verified shoreline features supersede those currently charted. CONCUR

Three more offshore features were investigated, two as AWOIS items. The third is an islet plotted on chart 16315 at:

59°00'~~.15~~ 10.5"'N
160°31'~~.30~~ 01.4"'W

This item is a reef (see R116) and the hydrographer recommends the islet symbol be changed to a reef symbol. CONCUR

<u>AWOIS 50934</u>

History: T9236/48 - Foul area; extends approximately 2 miles eastward from point of land at approx lat 58°59'40"N, long 160°30'05"W.
T-9230/47 - same as above (entered 6/85 RWD).
TP-01178/85 - reviewed, class III, NTH; 6 rocks and islet shown (foul with rocks) at the eastern end of the charted foul limit, however the full extent of the charted foul limit is not shown (updated 2/87 RWD).

Survey Requirements: full - verify or disprove the full extent of the charted foul area not shown on the present shoreline map by splitting lines to ensure adequate bottom coverage. LD and GP required on discovered features.

The following set of survey data describes the area of the investigation:

Day Number	Vessel	Fix Numbers	Type
196	2123	3322 - 3349	Mainscheme
196	2124	8547 - 8562	Crosslines
		8571 - 8664	Mainscheme
		4000 - 4004	Mainscheme
197	2124	4070 - 4086	Mainscheme
202	2124	4302 - 4305	Mainscheme ✓
210	2123	3618 - 3660	Mainscheme
211	2123	3679 - 3775	Mainscheme
212	2124	4640 - 4820	50m splits
213	2124	4824 - 4999	25m splits
215	2124	7000 - 7002	Shoreline
		7003 - 7017+	Mainscheme
		7018 - 7099	25 and 50m splits

The area from 58°59'15"N to 59°00'35"N was covered with 25 meter splits. These splits extended east from the shore to 160°30'00"W. Fifty meter splits were extended to the east as far as 160°28'00"W. All hydrography in this area is plotted on expansion sheet #1 (1:5,000). This development shows all water to the east of 160°30'15"W to be free of underwater obstructions. ✓

The islet at 58°59'42"N and 160°30'30"N was found to be much larger than depicted on the TP-sheet and chart. Four delineation positions were taken in order to better determine the size (Fixes 4631-4634). The hydrographer recommends changing the size of the islet on the chart, employing the four positions. (As shown on the smooth sheet). CONCUR

The area inshore of the islet was found to be generally free of obstructions up to the zero fathom curve, excepting a group of rocks which extend to the northwest of the islet. Fix number 4630 accurately positions the most inshore point of this group of rocks. The water inshore of this position is free of obstructions, though it is fairly shallow, especially near shore. The hydrographer recommends reducing the size of the foul area around the islet to include only the group of rocks extending from the islet (see final field sheet). CHART AREA AS SHOWN ON SMOOTH SHEET. CONCUR

At low tide, boulders were observed imbedded in the mud above the zero fathom curve in a wide swath off the northwest shore (see section P). The hydrographer recommends placing a note on the chart, between the zero fathom curve and the northwest shoreline, stating "mud with scattered boulders" (see final field sheet). CHART AREA AS SHOWN ON SMOOTH SHEET CONCUR

AWOIS 50935

History: T9231/47 - Rock awash; scaled at 1:20,000 in lat 59°00'40"N, long 160°16'06"W (entered 6/85 RWD).
TP01176/83 - reviewed, class III, NTH; rock awash located in 59°00'40.3"N, long 160°16'03.0"W scaled from map (updated 7/86 RWD).
Survey Requirements: full - verify position and elevation.

On day 203 launch RA-3 observed the rock in question and verified its position with fix number 3459:

59°00'40.~~32~~ 29"N
160°16'03.01"W

The rock was described as a large (2m by 2m), round, light grey rock composed of granite. When the elevation was corrected for the ~~predicted~~ actual tides, it was found to be 7.5 feet above MLLW. It is recommended that a rock be charted at the above position. *(8) CONCUR

M. Adequacy of Survey

This survey is the first basic survey to be conducted over this area. The data is complete and adequate to be used for charting purposes, and to supersede any historical data. CONCUR

N. Aids to Navigation

There is one fixed aid to navigation within the survey area. This aid is a flashing green and white aerobeacon located at the Togiak Airport. It does not appear on the largest scale chart of the area (chart 16315), nor is it mentioned in the latest edition of the Light List.

The beacon was positioned by intersection from stations NEMESIS, BLAKE, and TOG on July 29, 1987. For further details refer to the Horizontal Control Report for OPR-R184-RA-87. Enclosed in Appendix X is a photo of the beacon (on the left side of the red building). It was found to be 14.4064 meters high, and its position is:

59°03'08.567"N
160°23'33.116"W

The purpose of the aerobeacon is to allow pilots to find the Togiak Airport in times of inclement weather. The beacon is

maintained on a year round basis by the Togiak Airport. It is activated automatically by approaching aircraft or vessels. Three clicks of the microphone on frequency 122.5 MHz will turn on the beacon for thirty minutes. The hydrographer recommends adding this navigational aid to the chart. CONCUR

O. Statistics

EDP No.	Number of Positions	Reference Numbers	Nautical Miles of Sounding Lines
2123	76~~8~~ 6	--	198.9
2124	124~~23~~	28	291.1
2125	32	--	0.0
2126	277	--	43.7
2129	0	2	0.0
TOTAL	231~~42~~	30	533.7

SQUARE MILES OF HYDROGRAPHY	:	34.93
MILES OF SIDE SCAN	:	0.0
BOTTOM SAMPLES	:	32
TIDE STATIONS	:	4
VELOCITY CASTS	:	2
DAYS OF PRODUCTION	:	28
MAGNETIC STATIONS	:	0
CURRENT STATIONS	:	0

P. Miscellaneous

All bottom samples have been submitted to the Smithsonian Institution (Appendix IX).

Currents

No current observations were made during this survey. Shallow water in Togiak Bay made it unsafe for RAINIER to enter far enough north to conduct a current station on this sheet. We did, however, conduct a series of observations on sheet RA-20-2-87, just to the south of this sheet at:

58° 57.3'N
160° 21.1'W

The station was observed to exhibit a reversing current which conforms to the shoreline. The flood direction is NNW and the ebb direction is SSW. The maximum flood and ebb currents were found to be 2.4 and 1.1 knots, respectively. Further information on this current observation can be found in the Current Report OPR-R184-RA-87.

Siltation

A large percentage of the survey area was found to have a muddy bottom. Heavy siltation from rivers has most likely deposited this mud over the years. Aerial photography shows extensive mud flats, especially along the northwest shoreline. Our survey of that area demonstrated extremely shallow depths. At times it was difficult to obtain an acceptable fathogram trace due to the suspended mud in the shallow water. A trail of black was at many times seen following the launches while surveying. In order to tend station NEMESIS (signal 223), the mud was crossed on foot and found to be over waist deep in places (see Appendix XIII).

Low water shoreline verification on day number 220 showed scattered boulders imbedded in the mud all along the western shore. None of the hydrography in that area indicated the presence of rocks, nor did we hit any. A large storm passed the area and pummelled that shoreline with surf (taking out the tide staff at West Togiak tide station) a few days before the verification was undertaken. It appears that some sediment was also taken off that shoreline, leaving the rocks exposed. This demonstrates the fact that the mud moves around and slightly changes the characteristics and topography of the bottom. This might also help to explain the poor crossline to mainscheme agreement in that area, and quite possibly why islets in the 1947 aerial photography (at the head of the bay) are no longer there.

Loran-C

Fixes were simultaneously acquired with Loran-C and Mini-Ranger control across the survey area:

EDP Number	Day Number
2126	195
2124	196
2124	200
2124	202
2124	203

Vessel 2124 was the primary launch designated to gather the comparison data in order to present a sample of Loran-C performance in the area (in accordance with the Project Instructions and Hydrographic Survey Guideline No. 41). The launch Loran system used was an Internav LC204.

Loran-C available in the area is the 9990 chain, using the Y and Z secondary-station lines of position. Loran-C control was compared to Mini-Ranger control by converting Mini-Ranger rates to a geographic position, then plottng the G.P. along with the associated Loran rates on chart 16315. A sample of twenty comparisons were made. The comparisons showed very good agreement between the Loran-C and Mini-Ranger positions. In fact, the difference was almost negligible at the scale of chart 16315 (1:100,000). Loran-C was offset an average value of 0.05 nautical miles, bearing 320° T from Mini-Ranger positions. This offset was constant throughout the survey area.

Q. Recommendations

The hydrographer considers field work on this survey to be complete. No construction or dredging is planned in this area.

R. Automated Data Processing

Data acquisition and processing were accomplished with a PDP 8/e Hydroplot computer system, using the standard programs.

Computer Programs Used For Data Processing

NUMBER	DESCRIPTION	VERSION
RK 112	HYPERBOLIC,R/R HYDROPLOT	3/01/86
RK 116	RANGE-AZIMUTH RTS	3/01/86
RK 201	GRID, SIGNAL, AND LATTICE PLOT	4/18/75
RK 221	COMB R/R & HYPER PLOT NON-RT	7/25/86
RK 226	RANGE-AZ POSN & SND PLOT NON-RT	7/25/86
RK 300	UTILITY COMPUTATIONS	10/21/80
RA 362	RK 330 AND AM 602 COMBINED	8/20/84
RK 407	GEODETIC INVERSE/DIRECT COMP	9/25/78
RK 409	GEODETIC UTILITY PACKAGE	9/20/78
AM 500	PREDICTED TIDE GENERATOR	11/10/72
RK 530	LAYER CORRECTIONS FOR VELOCITY	5/10/76
RK 561	H/R GEODETIC CALIBRATION	12/01/82
RK 562	THEODOLITE CALIBRATION	9/05/84
AM 602	ELINORE - LINE ORIENTED EDITOR	12/08/82
RK 606	TAPE DUPLICATOR	8/22/74
AM 607	SELF-STARTING BINARY LOADER	8/10/80
RK 610	BINARY TAPE DUPLICATOR	1/31/85
RK 900	PLOT TEST TAPE GENERATOR FOR AM902	5/07/76
PM 901	CORE CHECK	3/01/72
AM 902	REAL TIME CHECKOUT	11/10/72
DA 903	DIAGNOSTIC-INSTRUCTION TIMER	2/27/76
RK 905	HYDROPLOT CONTROLLER CHECKOUT	3/18/81
RK 935	HYDROPLOT HARDWARE TESTS	3/15/82
RK 950	HARDWARE TESTS (DOCUMENTATION ONLY)	6/02/75

In plotting the final field sheet, overprints were removed by various techniques. The pen was manually lifted and special corrector tapes were made to edit out individual soundings. These tapes have not been submitted. Some soundings, especially least depths, have been transferred by hand to the final field sheet from NSP data.

Fix Numbers

A standard series of fix numbers was assigned to each survey vessel.

Vessel Number	Survey Fixes
2123	3000-3775
2124	4000-4999
	7000-7099
	8534-8705
2125	5000-5035
2126	6000-6279
2129	NONE

Vessel 2124 erroneously used fixes 8534-8705 on day number 196 by beginning the day with the first fix for sheet RA-20-2-87. There were no duplicate fix numbers recorded during this survey.

S. Referral to Reports

Several supplementary reports contain additional information relevant to this survey.

Supplemental Reports

TITLE	DATE SENT TO MARINE CENTER
Horizontal Control Report, OPR-R184-RA-87	October, 1987
Electronic Control Report, OPR-R184-RA-87	October, 1987
Marine Mammal Report, RP-12-87	October, 1987
Coast Pilot Report, OPR-R184-RA-87	October, 1987
Current Report, OPR-R184-RA-87	October, 1987

Respectfully Submitted;

P. Scott Hill

Philip Scott Hill
Ensign, NOAA

Approved and Forwarded;

C. W. Fisher

for Carl W. Fisher
Captain, NOAA
Commanding Officer, RAINIER

APPENDICES

I. Hydrographic Sheet Parameters

II. Field Tide Note

III. Geographic Names List

* ~~IV. Sounding Correction Abstract~~

* ~~V. Abstract of Corrections to Electronic Positioning Control~~

VI. List of Stations

* ~~VII. Abstract of Positions~~

* ~~VIII. Carto Code Listing~~

* ~~IX. Bottom Samples~~

X. Non-Floating Aids and Landmarks for Charting

* ~~XI. Request for Approved Tides~~

XII. Dangers to Navigation —— NONE

XIII. Supplemental Information

XIV. Approval Sheet

* THESE ITEMS HAVE BEEN FILED WITH THE SEPARATES IN THE BACK OF THE DATA CAHIERS

FIELD TIDE NOTE
OPR-R184-RA-87

Field-tide reduction of soundings was based on predicted tides computed with program AM 500, Predicted Tide Generator, by using the predicted tides for Black Rock, Walrus Islands, Bristol Bay tide station (946-5182) provided by the Sea and Lake Levels Branch of the National Ocean Service (attached). The correctors that were used for the head of Togiak Bay (H 10249) are as follows:

Time Correction		Height
High Water	Low Water	Ratio
+0hr 30min	+0hr 30min	x1.06

Tide station information follows:

N.E. SUMMIT ISLAND, ALASKA (946-5283)

Geographic Locale- Lat: 58° 50.0' N, Long: 160° 12.6' W.

Installation Date- June 9, 1987

Removal Date- September 1, 1987

Gage Type- Bristol Bubbler (S/N 64A-11030). There was a backup Bristol Bubbler, (S/N 67A-10292), which was installed at the same time. The gages were placed inside a small wooden shed approximately ten feet above the high water line.

Staff- The staff was constructed from a 12 foot long piece of aluminum angle iron with 4-inch webs. It was secured to a rock ledge 100 feet east of bench mark 5283 D with lag bolts. The scale was standard vitrified mounted to the staff. The staff stop was a stainless steel hex machine bolt located at 18.100 feet on the staff. On June 30, it was discovered that the staff had been blown down in heavy weather and on July 7, the staff was recovered and replaced.

Staff Zero/Gage Zero-

Before 7/7:	For S/N 64A-11030: 2.0 feet
	For S/N 67A-10292: 3.2 feet
After 7/7:	For S/N 64A-11030: 1.5 feet
	For S/N 67A-10292: 3.0 feet

Gage Time- Universal Coordinated Time

Bench Marks- Five bench marks were connected by the initial and final leveling. They are: 5283 A 1986, 5283 B 1986, 5283 C 1986, 5283 D 1986, 5283 E 1986.

Levels- Installation levels were run on June 9, connecting four of the five bench marks mentioned above. On July 7, the levels, connecting all five bench marks, were rerun in conjunction with the replacement of the staff. The new staff placement showed a 0.075m (0.24 ft) change in the elevations of the staff. Removal levels were run on September 1.

Marigram Records-
GAGE # 64A-11030: The marigram records are continuous from 6/10/87 at 0504Z until 6/26/87 at 1530 Z, and from 6/27/87 at 2206Z until 8/1/87 at 2112Z and from 8/1/87 at 2200Z until 9/1/87 at 1800Z when the gage was removed.

GAGE # 67A-10292: The marigram records are continuous from 6/11/87 at 0106 Z until 6/17/87 at 1620 Z and from 6/17/87 at 1741 until 6/29/87 at 2318 Z, and from 6/29/87 at 2330Z to 8/1/87 at 2112Z, and from 8/1/87 at 2200Z to 9/1/87 at 1800Z when the gage was removed.

Station Problems- On June 17, the chart drive(S/N 518515) in gage 67A-10292 was replaced with a new chart drive (S/N 513628) due to a problem with the take-up spool. On June 24, at approximately 0100 Z in gage 67A-10292 a "dip" in the marigram trace was noticed. On June 25, at approximately 0450 Z the marigram record for gage 64A-11030 showed a similar 0.5 ft "dip" near low tide; there was no apparent change in the staff to gage ratios in either of the two cases mentioned above. On June 26, gage 64A-11030 was discovered to have run out of paper. On June 30, the staff was discovered to have been blown down in heavy weather,and on July 7, the staff was recovered and replaced. During the period between June 30 and July 7 no hydrographic surveying was conducted.

EAST SIDE, TOGIAK BAY, ALASKA (946-5346)

Geographic Locale - Lat: 58° 57.2' N Long: 160° 19.1' W

Installation Date - June 20, 1987

Removal Date - September 1, 1987

Gage Type - Bristol Bay Bubbler (S/N 73A-231). Back up gage was a Bristol Bay Bubbler (S/N 68A-9333), which was installed at the same time. Both gages were placed against the face of a bluff approximately 20 feet above the high water line. On 6/25/87 gage S/N 68A-9333 was replaced by gage S/N 67A-1029A due to poor staff to gage comparisons.

Staff - The staff was constructed of a 12 foot long 4"x4" aluminum angle iron with vitrified scale. The staff was bolted to a ledge 140 feet west of BM E. The staff stop was a stainless steel lag bolt at 16.010 feet on the staff.

Staff Zero/Gage Zero-
For gage 68A-9333: 4.3 ft
For gage 67A-1029A: 5.6 ft
For gage 73A-231: 4.6 ft

Gage Time - Universal Coordinated Time

Bench Marks - Five bench marks were established when the gage was installed. They are 5346 A 1987, 5346 B 1987, 5346 C 1987, 5346 D 1987, and 5346 E 1987.

Levels - Levels were run during installation on June 20, and upon removal on September 1, connecting the five bench marks. The elevations of the bench marks at installation and removal agreed to within 0.005m (0.016ft).

Marigram Records -
GAGE # 68A-9333: The marigram is continuous from 6/21/87 at 0148Z until 6/24/87 at 0550Z when the gage was replaced by gage 67A-1029A.

GAGE # 67A-1029A: The marigram is continuous from 6/25/87 at 2318 Z until 7/21/87 at 1730 Z, and from 7/21/87/ at 1800 Z until 8/1/87 at 1854 Z, and from 8/1/87 at 1930 Z until 9/1/87 at 1627 Z when the gage was removed.

GAGE # 73A-231: The marigram is continuous from 6/21/87 at 01030 Z until 7/21/87 at 1730 Z, and from 7/21/87 at 1812 Z until 8/1/87 at 1854 Z, and from 8/1/87 at 1930 Z until 8/8/87 at 1912 Z when the gage was removed.

Station Problems- The gage 68A-9333 showed poor staff to gage ratios during three hour observations on 6/23/87 and was replaced on 6/25/87 with gage 67A-1029A.

The staff to gage readings for the month of August showed a drop of 0.5 ft for both gages as compared to the previous months. This would indicate a shift in the depth of the orifices. Since there was no movement of the staff the actual reason for the shift is not known.

There were minor problems with the chart drives loosing time at this station.

NORTH TOGIAK BAY, ALASKA

Geographic Locale - Lat: 59° 03.2' N Long: 160° 20.0' W

Installation Date - JULY 30, 1987

Removal Date - August 2, 1987

Gage Type - Bristol Bay Bubbler (S/N 67A-16205). The gage was located at the Togiak Seafoods dock on the southwest corner of the dock.

Staff - The staff was constructed of a 16 foot long wooden 2"x4" with vitrified scale. The staff was nailed to the southwest piling of the dock.

Staff Zero/Gage Zero- 20.6 ft

Gage Time - Universal Coordinated Time

Bench Marks - No bench marks were established or recovered for this three day gage installation.

Levels - No levels were run on this installation.

Marigram Records - The marigram records are continuous from 7/31/87 at 1750 Z until 8/2/87 at 1900 Z.

Station Problems- This three day gage was installed in the north end of Togiak Bay to compare the time differences between the head of the bay and the mouth of the bay. Due to the fact that the bay is a very shallow, flat bottomed bay, the orifice was only covered 2.5 ft during high tide and was exposed at all other tides.

WEST SIDE, TOGIAK BAY, ALASKA (946-5359)

Geographic Locale - Lat: 58° 59.2' N Long: 160° 32.5' W

Installation Date- June 7, 1987

Removal Date- August 31, 1987

Gage Type - Bristol Bay Bubbler (S/N 62A-92). Back up gage was a Bristol Bay Bubbler (S/N 68A-9335), which was installed at the same time. Both gages were placed against the face of a bluff approximately 20 feet above the high water line.

Staff - The staff was a 12 foot long 4"x4" aluminum angle iron secured to a rock ledge with lag bolts and supported by 2x4 wooden braces. The staff was located 87 feet southwest of BM A. The staff stop was at 16.871ft on the staff. On August 6 the staff was discovered missing, and was recovered and replaced on August 7.

Staff Zero/Gage Zero-

Before 8/7:	For gage 62A-92: 5.0 ft
	For gage 68A-9335: 2.3 ft
After 8/7:	For gage 62A-92: 5.0 ft
	For gage 68A-9335: 1.8 ft

Gage Time - Universal Coordinated Time

Bench Marks - Five bench marks were established upon installation of the gage; they are 5359 A 1987, 5359 B 1987, 5359 C 1987, 5359 D 1987, and 5359 E 1987.

Levels - Levels were run connecting the five bench marks upon installation of the gage on June 22. Levels were run between bench marks A, B, and E on August 7, when the staff was replaced. Final levels were run on August 31, upon the removal of the gage. Installation and removal elevations agreed to within 0.005m (0.016ft). There was a decrease in elevation of 0.013m when the staff was replaced.

Marigram Records -
GAGE # 68A-9335: Marigram records are continuous from 6/26/87 at 2135Z until 7/6/87 at 0455Z when the chart drive ran out of paper, and from 7/8/87 at 0115 Z until 8/1/87 at 1648 Z, and from 8/1/87 at 1718 Z until 8/19/87 at 2227 Z when the paper was changed, and from 8/19/87 at 2308 Z until 8/31/87 at 2224 Z when the gage was removed.

GAGE # 62A-92: Marigram records are continuous from 6/25/87 at 2206 Z until 7/7/87 at 1530 Z when the chart drive ran out of paper, and from 7/8/87 at 0125 Z until 8/1/87 1648 Z and from 8/1/87 at 1718 Z until 8/20/87 at 2048 Z, and from 8/20/87 at 2100 Z until 8/22/87 1706 Z when the paper was replaced due to damp paper, and from 8/22/87 at 1718 Z until 8/31/87 at 2224 Z when the gage was removed.

Station Problems

On August 6, the staff was discovered to have been blown down, and was replaced on August 7. Otherwise there were no significant problems encountered with the station.

MASTER STATION LIST
OPR-R184-RA-87, TOGIAK BAY, ALASKA
RA-20-3-87 (H-10249)

FINAL VERSION

```
119 3  58 55 55384 160 14 24307  139 0028 000000
/OWENS 1948,     G-15848, QUAD 581601, STA. 1008

120 3  58 52 07284 160 09 46645  139 0004 000000
/UNGALI 1987                        RAINIER G.P.

121 3  58 56 46472 160 18 58407  250 0035 000000
/TOG 1987                           RAINIER G.P.

122 3  59 00 46511 160 15 55039  250 0025 000000
/BLAKE 1987                         RAINIER G.P.

201 3  58 50 49897 160 13 15720  250 0151 000000
/SUMMIT 1948 AZ MK, G-15848, QUAD 581601, STA. 1011

209 3  58 53 19525 160 14 32983  139 0009 000000
/DUCE 1987                          RAINIER G.P.

223 3  59 01 57366 160 28 15468  250 0058 000000
/NEMISIS 1948,   G-15848, QUAD 591607, STA. 1007

226 3  58 55 35101 160 42 13672  250 0071 000000
/QUIG 1987                          RAINIER G.P.
```

NOAA FORM 76-40
(8-74)
Replaces C&GS Form 567.

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [X] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

[X] TO BE CHARTED [ ] TO BE REVISED [ ] TO BE DELETED	REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
	RAINIER	Alaska	Togiak	7/87

The following objects HAVE [X] HAVE NOT [ ] been inspected from seaward to determine their value as landmarks.

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-R184-RA-87	--	RA-20-3-87	NAD 1927

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
AERO	Aerobeacon, flashing green and white light, located on red building Ht.=14.4064 meters	59-03	08.567	160-23	33.116		F-3-6-L 7/29/87	16006 16011 16315
	CL-271 (88)							

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD	Carl W. Fisher, CAPT, NOAA Commanding Officer Chief of Party	☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER *(Specify)*
POSITIONS DETERMINED AND/OR VERIFIED	John C. Damm, ENS, NOAA	FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

EXAMPLE: 75E(C)6042
8-12-75

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field	P - Photogrammetric
L - Located	Vis - Visually
V - Verified	
1 - Triangulation	5 - Field identified
2 - Traverse	6 - Theodolite
3 - Intersection	7 - Planetable
4 - Resection	8 - Sextant

A. Field positions* require entry of method of location and date of field work.

EXAMPLE: F-2-6-L
8-12-75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont'd)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P-8-V
8-12-75
74L(C)2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

Photo taken from station NEMESIS.

Scattered boulders are present as small, brown dots on photo.

← greener water demonstrates where it gets deeper

← water only a few inches deep

← Local fishing boat

← 19' Monark

Tracks in mud →

Photo showing the Wharf at Togiak Fisheries, Inc. of Twin Hills. Photo was taken looking due south.

APPROVAL SHEET

Descriptive Report to Accompany

Hydrographic Survey

RA-20-3-87

H-10249

Standard procedures were followed in accordance with the Hydrographic Manual, Third Edition; Hydrographic Survey Guidelines; and PMC OPORDER in producing this survey. The data were examined daily during acquisition and processing phases of the survey.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.

Carl W. Fisher
Captain, NOAA
Commanding Officer

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: December 29, 1987

MARINE CENTER: Pacific

OPR: R184

HYDROGRAPHIC SHEET: H-10249

LOCALITY: Head of Togiak Bay, Bristol Bay, Alaska

TIME PERIOD: July 14 - August 12, 1987

TIDE STATION(S) USED: 946-5346 East Side Togiak Bay, AK
946-5358 West Side Togiak Bay, AK

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 946-5346 = 9.80 ft.
946-5358 = 9.08 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 946-5346 = 9.5 ft.
946-5358 = 9.4 ft.

REMARKS: RECOMMENDED ZONING

1. East of longitude 160 25.0' zone direct on 946-5346.

2. West of longitude 160 25.0' zone direct on 946-5358.

James C. Hubbard

CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10249

Name on Survey	A ON CHART NO. 16315	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K Manuscript TP-01176	
ALASKA, TOGIAK BAY HEAD OF TOGIAK BAY										
ALASKA (TITLE)	X								X	1
TOGIAK	X								X	2
TOGIAK BAY	X								X	3
TOGIAK RIVER	X								X	4
KURTLUK RIVER	X								X	5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
				Approved:						18
										19
				Charles E. Harrington						20
				Chief Geographer - N/CG2x5						21
				FEB 17 1988						22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

FILE COPY

NOV 18 1987 N/MOP21x2/MM

TO: Commanding Officer
NOAA Ship RAINIER

FROM: N/MOP - Robert L. Sandquist

SUBJECT: Preprocessing Examination of
H-10248, Alaska, Togiak Bay, East Togiak Bay to Ungalikthluk Bay
H-10249, Alaska, Togiak Bay, Head of Togiak Bay

Hydrographic surveys H-10248 and H-10249 have been reviewed in accordance with Hydrographic Survey Guideline No. 15, and the Preprocessing Examination Critique for these surveys is attached. Surveys H-10248 and H-10249 are accepted for Pacific Marine Center processing.

Data from these surveys reveal that additional care and effort should be expended while conducting shoreline verification and evaluating shoreline detail. Adherence to proper shoreline verification procedures will become even more important when RAINIER commences hydrographic operations along the southern Alaska peninsula.

The Preprocessing Examination Critique is designed to provide information which will be useful to the Command for maintaining the quality of future hydrographic surveys. I encourage you to use this information constructively. Your comments on specific critique items are welcome.

Attachment

cc: N/MOP2x1
N/MOP21x2
N/MOP211
N/CG2

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Pacific Marine Center
Nautical Chart Branch
7600 Sand Point Way NE
Seattle, Washington 98115-0070

November 13, 1987 N/MOP21x2/MM

TO: N/MOP - Robert L. Sandquist

FROM: N/MOP 21 - Thomas W. Richards

SUBJECT: Preprocessing Examination for H-10248 and H-10249

I. SURVEY INFORMATION

A. Field No. RA-20-2-87 Registry No. H-10248
RA-20-3-87 H-10249

B. State: Alaska

General Locality: Togiak Bay

Sublocality: East Togiak Bay to Ungalikthluk Bay
Head of Togiak Bay

C. Project Instructions: OPR-R184-RA-87

Original dated: March 6, 1987

Change No. 1 dated: March 20, 1987
No. 2 dated: June 2, 1987
No. 3 dated: August 10, 1987

D. Dates:

	H-10248	H-10249
Field Work Commenced:	June 22, 1987	July 14, 1987
Field Work Completed:	July 31, 1987	Aug 12, 1987
plus 6 weeks:	Sept 11, 1987	Sept 23, 1987
Data received at Marine Center:	Sept 28, 1987	Sept 30, 1987
plus 1 month:	Oct 28, 1987	Oct 30, 1987

Examination critique transmitted to field November 18, 1987

Target for completion of Marine Center processing May 18, 1988

II. PREPROCESSING EXAMINATION CRITIQUE

Hydrographic surveys H-10248 and H-10249 were performed by personnel of the NOAA Ship RAINIER, Captain Carl W. Fisher, Commanding Officer. The following personnel supervised portions of the data acquisition: Lieutenant Commander Schomaker, Lieutenant White, Lieutenant (jg) Damm, Ensigns Poston, O'Mara, Hill, Meis and Larsen.

In accordance with the Preprocessing Examination System set forth in Hydrographic Survey Guideline (HSG) No. 15, Section III, the following items are brought to your attention:

A. Danger to Navigation Report:

RAINIER reported three dangers to navigation within the limits of H-10248 and no dangers within H-10249.

It is possible that additional dangers to navigation lie above the mean lower low water line along the western shore of northern Togiak Bay. The hydrographer described the locality, explained that the rocks were not "significant dangers to navigation" and submitted a photograph of the area (refer to Section D of this report). Dangers to navigation are not classified as "significant" or "insignificant"; they either exist or do not exist.

B. Compliance with Instructions:

Surveys H-10248 and H-10249 generally comply with the Project Instructions. RAINIER investigated five AWOIS items within the limits of the two surveys (H-10248: AWOIS #50929, 50932; H-10249: AWOIS #50934, 50935 and 50936).

C. Final Field Sheets:

Bottom sample spacing on both surveys was approximately 9 cm at the scale of the survey. Bottom sample spacing within inshore surveys should not exceed 6 cm [HM 1.6.3].

The following comments pertain to H-10248:

Reference numbers were assigned to new features, disproved features and features found on prior shoreline manuscripts. Reference numbers are to be assigned only to those features which are shown on contemporary shoreline manuscripts and which have been visually verified [PMC OPORDER Section 3.6.1].

No descriptions or heights were given to three islets on the northwest side of Summit Island (one which lies within a foul area). It is not known if these islets exist or if there are higher features within the foul areas. All shoreline features on shoreline manuscripts are to be examined and either verified, changed or disproved [PMC OPORDER Section 3.6].

The following comments pertain to H-10249:

One reference number, R129, was used to indicate the existence of several scattered boulders on the western shore of northern Togiak Bay that do not appear on the shoreline manuscript but were observed above the zero-fathom curve. These boulders, described as rising one to two feet above the mud, were not positioned. The hydrographer is responsible for positioning all features seaward of the mean high water line [HM 1.4.3].

Mainscheme sounding lines were run parallel to the depth curves. Additional mainscheme "splits" were run to better define the 1-, 2-, and 3-fathom curves. Crosslines should be run prior to mainscheme lines, particularly where there are no or few charted soundings, in order to aid in determining the pattern of mainscheme lines [HM 1.4.2].

Additional sounding lines delineating the zero-fathom curve would also have been useful.

The corrector tapes made for a large development on the southwest side of the survey did not adequately designate "NSP" data. The position plot generated by Nautical Chart Branch (using data tapes submitted with the survey) shows several closely-spaced sounding lines which are not plotted on the final field sheets (see Attachment A). The final field sheet should reflect the contents of the data tapes [PMC OPORDER Section 3.5.1.d.a.(a), pp. 3.5-12].

D. Descriptive Report:

The hydrographer, in Section H (H-10248), recommends retaining those features originating from prior shoreline manuscripts which could not be sufficiently examined at MLLW in order to disprove their existence. Section H also contains a statement that reference numbers were assigned to some features that could not be sufficiently examined at MLLW to disprove their existence. The least depth of detached features surrounded by navigable waters, regardless of the importance of the area, should be determined [HM 1.4.3].

Section L (Comparison with the Chart) of H-10249 includes a statement regarding a small channel used by flat-bottom boats leading to the Togiak Fisheries, Inc. dock. The only soundings appearing on the final field sheet are those mainscheme lines and mainscheme splits in the general area. Additional lines should have been run to better delineate this shallow channel even though it is above the mean lower low water line [HM 4.3.5.4].

The hydrographer states in Section H (Shoreline) of H-10248 that changes to shoreline are shown in red on the final field sheet. There are no changes shown in red on the final field sheet.

Appendix X (Non-Floating Aids and Landmarks for Charting) of H-10249 contains information for an aerobeacon which was positioned (via intersection) during the survey. NOAA Form 76-40 does not include the official name, Togiak Aerobeacon 1987, of the station. Station names, where applicable, should appear on NOAA Form 76-40 in parentheses [NOAA Form 76-40, Description].

The name, East Togiak Bay, was given as part of the sublocality for H-10249. East Togiak is not a proper title for a sublocality [HSG 19, pp.4-6].

E. Echograms:

There are no apparent problems with the interpretation or annotations on the echograms submitted for the surveys.

F. Sounding Volumes and/or Raw Data Printouts:

A non-standard abbreviation, P.U., was used on raw data printouts for H-10249. Abbreviations written on printouts should originate from Appendix E of the Hydrographic Manual or the abbreviation and its translation should be noted at the beginning of the printout.

K. Special and/or Ancillary Reports:

The Electronic Control Report was briefly reviewed during this examination. No apparent problems were evident with any data.

L. Automated Data Check:

No significant problems occurred during the spooling of either survey.

N. Survey Acceptance:

The preprocessing examination for H-10248 and H-10249 was conducted under the time constraints of HSG 15. All comments contained herein are based on a spot check of the data, and it is possible that some problem areas have not been addressed.

Except for the items noted in the critique, surveys H-10248 and H-10249 are in compliance with the Project Instructions. I recommend that H-10248 and H-10249 be accepted for Nautical Chart Branch processing.

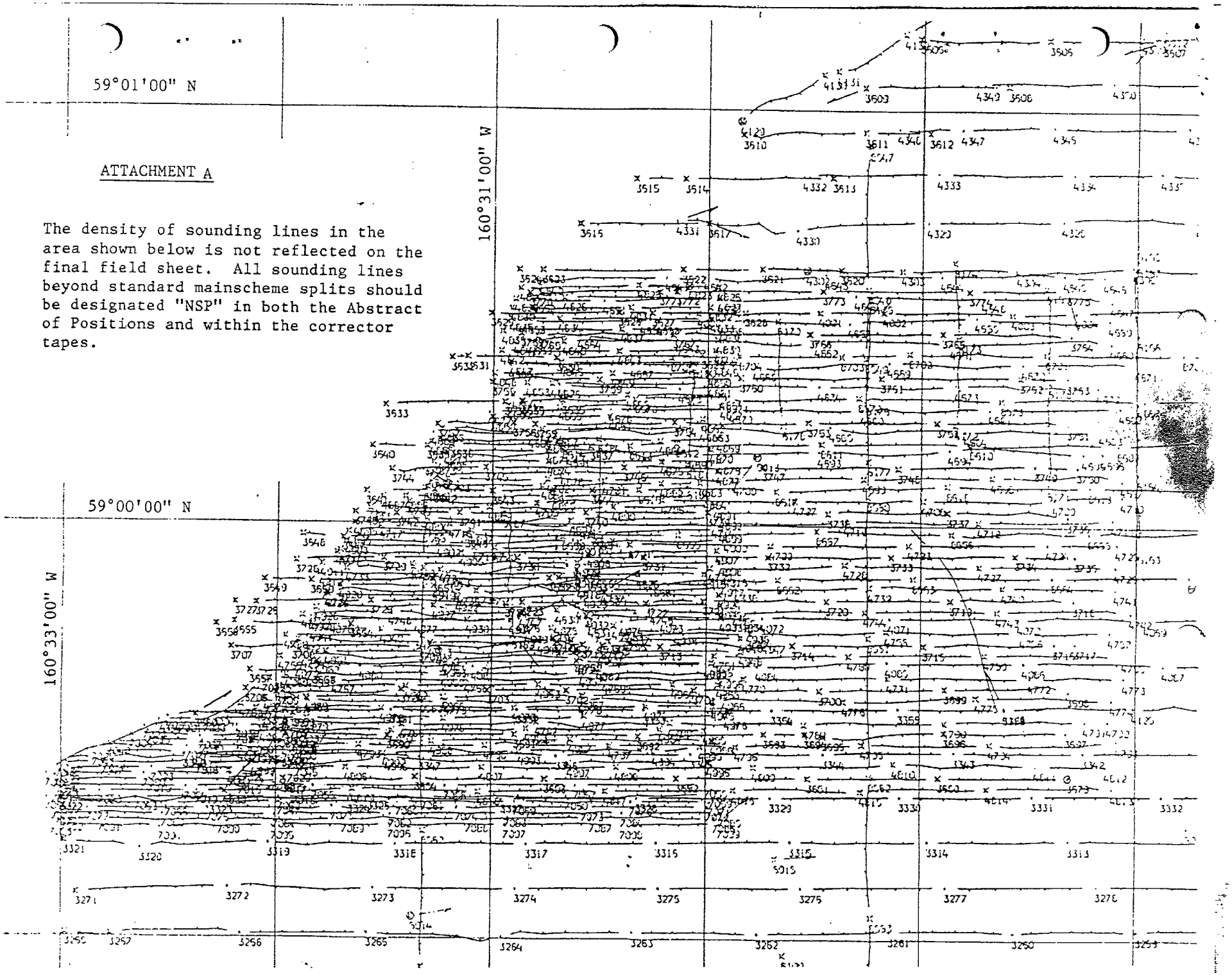
Prepared by:

Marlene Mozgala

Marlene Mozgala

ATTACHMENT A

The density of sounding lines in the area shown below is not reflected on the final field sheet. All sounding lines beyond standard mainscheme splits should be designated "NSP" in both the Abstract of Positions and within the corrector tapes.



NOAA FORM 77-27(H)
(9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER
H-10249

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	8
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	3

DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS	
ACCORDION FILES						
ENVELOPES						
VOLUMES	2					
CAHIERS	2					
BOXES						

SHORELINE DATA

SHORELINE MAPS (List):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

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			2312
POSITIONS REVISED			25
SOUNDINGS REVISED			450
CONTROL STATIONS REVISED			-0-
	TIME-HOURS		
	VERIFICATION	*EVALUATION*	*TOTALS*
PRE-PROCESSING EXAMINATION			
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS	162		162
VERIFICATION OF SOUNDINGS	118.5		118.5
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	64		64
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10	10
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		20	20
GEOGRAPHIC NAMES			
OTHER* Digitization			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	344.5	30	374.5

Pre-processing Examination by LT M. Mozgala	*Beginning Date* 36 hours	*Ending Date* 11/18/87
Verification of Field Data by R. Shipley	*Time (Hours)* 344.5	*Ending Date* 4/21/88
Verification Check by J. Stringham, B. Olmstead, T. Jones	*Time (Hours)* 73	*Ending Date* 4/22/88
Evaluation and Analysis by G. Kay	*Time (Hours)* 30	*Ending Date* 7/6/88
Inspection by D. Hill	*Time (Hours)* 2	*Ending Date* 7/ /88

☆ U.S. GOVT. PRINTING OFFICE 1983: 764-006/6061

PACIFIC MARINE CENTER
Evaluation Report
H-10249

1. INTRODUCTION

H-10249 is a basic hydrographic survey accomplished by the NOAA Ship RAINIER under the following Project Instructions.

OPR-R184-RA-87, dated March 6, 1987
CHANGE Number 1, dated March 20, 1987
CHANGE Number 2, dated June 2, 1987
CHANGE Number 3, dated August 10, 1987

This survey is in Alaska and covers the area at the northern limit of Togiak Bay. The surveyed area extends south to latitude 58°58'00"N, and west to longitude 160°33'00'W. The bay is shallow with depths ranging from a deep of 4.1 fathoms at the southern limits to mud flats at the mouth of the Togiak River. The bottom consists of sand, mud, and gravel.

Predicted tides for Black Rock, Alaska, were used for the reduction of soundings during field processing. Approved hourly heights zoned from the East Side, Togiak Bay gage, 946-5346, and West Side, Togiak Bay gage, 946-5358, were used during office processing.

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. The TRA, sound velocity and electronic control correctors are adequate. An accompanying computer printout contains the parameters and the correctors.

The survey records contained data marked, "Not to be smooth plotted" (NSP). During office processing, some NSP depths in the vicinity of latitude 58°59'47"N, longitude 160°30'40"W were discovered to be shallower than the depths plotted on the field sheet. The NSP designation was removed from all records in the digital file. These depths were fully processed and appear on the smooth sheet if appropriate.

A digital file, generated for this survey, includes categories of information required to comply with N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. Certain descriptive information, however, may not be in the digital record due to the restrictions of the presently available cartographic codes. The user should refer to the smooth sheet for complete information.

2. CONTROL AND SHORELINE

Sections F and G of the hydrographer's report (pages 7-10) and the Horizontal and Electronic Control Reports for OPR-R184-RA-87 contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are 1948 published and 1987 field values based on NAD 1927. These values were used during office processing for the computation of positions. The smooth sheet and accompanying overlays are annotated with NAD 1983 adjustment ticks based on values determined by N/CG121. Geographic positions based on NAD 1983 may be plotted on the smooth sheet utilizing the NAD 1927 projection by applying the following corrections:

latitude: +2.767 seconds (85.6 meters)
longitude: -7.963 seconds (-126.9 meters).

The year of establishment of some control stations shown on the smooth sheet originates with the hydrographer's signal list and is subject to change pending certification of the data by NGS.

There are eleven weak fixes noted in this survey. However, there are no significant plotting differences between the soundings located by these fixes and those in adjacent areas. Also, none of these fixes are used to position dangers to navigation. These fixes are considered acceptable.

The following registered shoreline maps apply to this survey.

	Photo Date	Class
TP-01176	July, August 1983	III
TP-01178	July 1985	III
TP-01186	July, August 1983	III

The island located by the hydrographer at latitude 58°59'45"N, longitude 160°30'30"W, was positioned by four detached positions. Although the island is depicted with a solid line on the field sheet the positioning is considered to be insufficient for accurate delineation of this feature. Accordingly, it is displayed with a dashed red line to indicate an approximate delineation.

3. HYDROGRAPHY

Hydrography is adequate to:

a. delineate the bottom configuration, determine least depths, and draw the standard 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.

4. CONDITION OF 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, and the PMC OPORDER, except as noted in the attached copy of the Preprocessing Examination Report, dated November 18, 1988, and as follows.

The hydrographer provides confusing information about the configuration of the berthing facilities at Togiak Fisheries, Inc., located at latitude 59°03'24"N, longitude 160°19'48"W. The raw data records clearly state that a pier was observed and due to the presence of a ship tied up to it the NE corner was located from "15 meters off". Scaling 15 meters from the fix places the end of the feature at the present HWL which conforms to the depiction on the shoreline map and the final field sheet, neither of which shows a pier. The hydrographer supplied a photograph of the facilities as viewed from seaward and there is no pier discernible. It is assumed the hydrographer located a wharf, not a pier. The smooth sheet depiction originates with shoreline map TP-01176.

5. JUNCTIONS

H-10249 junctions with the following surveys:

Survey	Year	Scale	Area
H-10248	1987	1:20,000	South
H-10251	1987	1:20,000	Southwest

The junctions are complete. Two soundings and a small ledge were transferred to survey H-10249 from H-10251 to better portray the bottom and foreshore in the common area.

6. COMPARISON WITH PRIOR SURVEYS

There are no prior hydrographic surveys within the limits of survey H-10249.

The following four prior shoreline maps were compared with H-10249, as required by CHANGE Number 5 of the project instructions.

Survey	Year	Scale	Transferred features color
T-9230	(1947)	1:20,000	violet
T-9231	(1947)	1:20,000	no features transferred
T-9236	(1948)	1:20,000	red
T-9237	(1947-48)	1:20,000	red-violet

Differences were noted with the representation of ledges and some rocks on the priors. In areas where these differences occur, the most conservative approach was taken and the features that plotted furthest off shore were transferred to the smooth sheet.

With the transfer of features from T-9230, T-9236 and T-9237 to survey H-10249, the present survey is adequate to supersede these shoreline maps as a charting source within the area of common coverage.

There are no AWOIS items originating from prior surveys applicable to this survey.

7. COMPARISON WITH CHART

Chart 16315, 3rd Edition, dated 2/28/87; scale 1:1:100,000
Chart 16315, 4th Edition, dated 1/2/88; scale 1:1:100,000

a. Hydrography Soundings and charted features on the 3rd edition originate from miscellaneous sources. See section L of the hydrographer's report (pages 16-20) for an adequate discussion of the comparison with charted features.

The 4th edition of chart 16315 was updated with the H-10249 field sheet.

H-10249 is adequate to supersede charted hydrography within the common area.

b. AWOIS AWOIS items 50934, 50935 and 50936 originate from miscellaneous sources and are adequately discussed in section L of the hydrographer's report (pages 16-20).

c. Controlling Depths There are no charted channels with controlling depths within the limits of this survey.

d. Aids to Navigation There are no charted aids to navigation within the limits of this survey. However, the hydrographer located an aero beacon which he recommends for charting. The evaluator concurs and recommends the feature be charted as a landmark. A complete discussion can be found in section N of the hydrographer's report (pages 20-21).

e. Geographic Names Names appearing on the smooth sheet and in the survey title have been approved by the Chief Geographer and are plotted in accordance with this chart.

f. Dangers to Navigation No reports of dangers to navigation were generated during the survey or office processing.

8. COMPLIANCE WITH INSTRUCTIONS

Survey H-10249 adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

This is an excellent basic survey. No additional field work is recommended.

Gordon E. Kay
Cartographer

This survey has been examined and it meets Charting and Geodetic Services' standards and requirements for use in nautical charting. This survey is recommended for approval.

Dennis Hill
Chief, Hydrographic Section

APPROVALS

I have reviewed the smooth sheet, accompanying data, and reports associated with hydrographic survey H-10249. This survey meets or exceeds Charting and Geodetic Services' standards for products in support of nautical charting.

Thomas W. Richards 8-30-88
Chief, Nautical Chart Branch (Date)

CLEARANCE: SIGNATURE AND DATE:

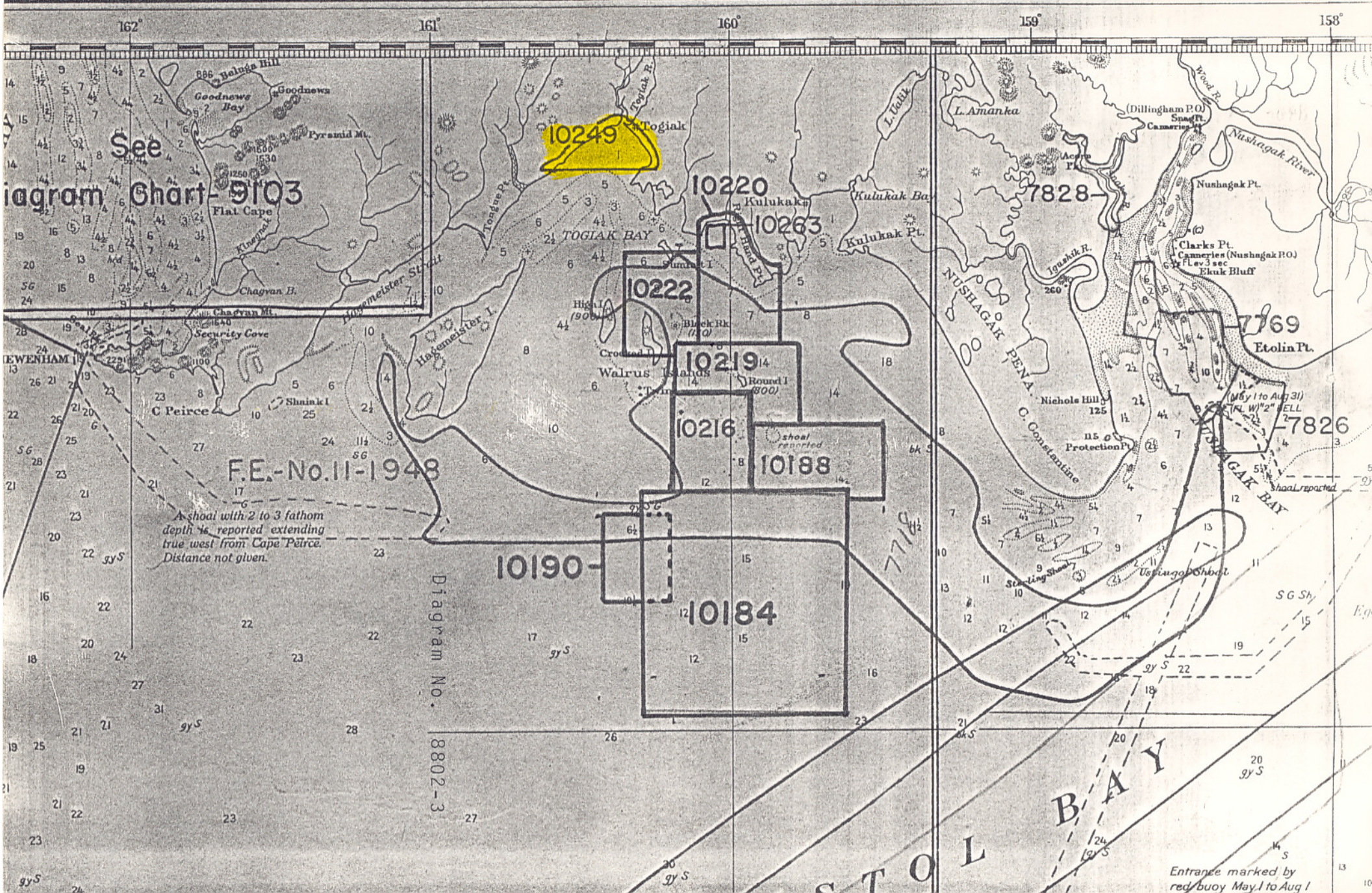
N/MOP2:LWMordock Larry W. Mordock 8-30-88

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards.

Larry W. Mordock For 8-30-88
Director, Pacific Marine Center (Date)

(3 Sheets)

10188
7718



NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

EXAMINED FOR NM
GDBU
Bh. S. 12-7-89

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10249

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
16315	10-1-87	Kevin Barthel	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 3
16011	3-14-89	Russell P Kennedy	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 30 Applied through Chart 16315
16006	7/7/93	Kenny O'Neff	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 27 APPLIED THRU C-16011 # 31.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.

app'd to Std's 9-20-88 PSR