

10219

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-20-2-86

Registry No. H-10219

LOCALITY

State Alaska

General Locality .. Bristol Bay

Sublocality Round Island & Vicinity

1986

CHIEF OF PARTY

CAPT. C.W. Fisher

LIBRARY & ARCHIVES

DATE October 20, 1987

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

ACPG Area 5

CHTS

16315

16011

16006

Cartog:

Sign off on
form in back

HYDROGRAPHIC TITLE SHEET

H-10219

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 20-2-86

State Alaska

General locality Bristol Bay

Locality Round Island and Vicinity

Scale 1:20,000 Date of survey June 28 - August 6, 1986

Instructions dated April 16, 1986 Project No. OPR-R184-RA-86

Vessel RAINIER S221 (2120), Launch's : 2123, 2124, 2125, 2126

Chief of party Capt. Carl W. Fisher, NOAA

Surveyed by LT White, LTJG Porta, LTJG LaReau, ENS Brown, ENS Damm, ENS Poston,
ENS O'Mara

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

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Verification by Thelma O. Jones Automated plot by PMC Xynetics Plotter

~~Produced by~~ Evaluation by Gordon E. Kay

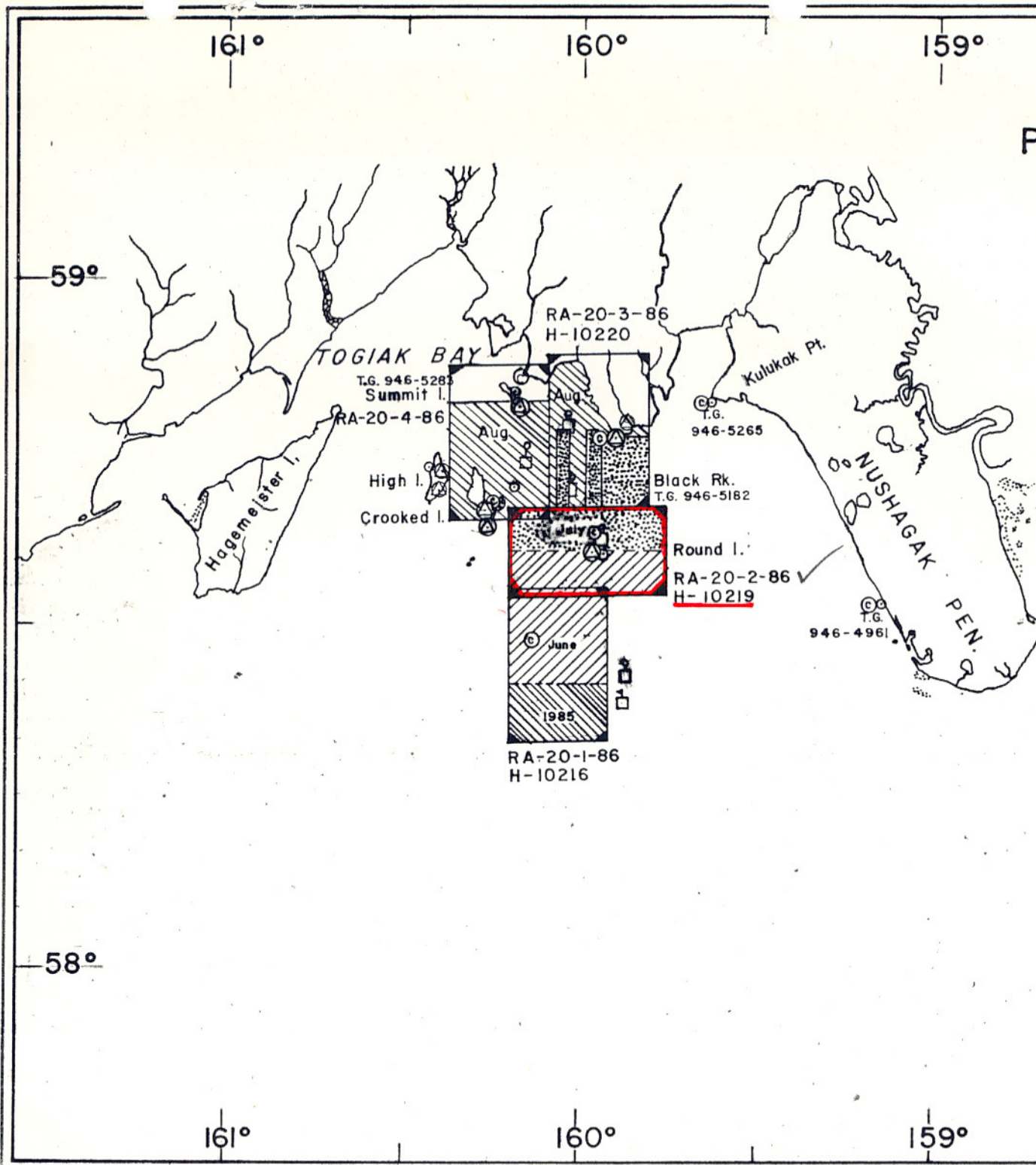
Soundings in fathoms ~~feet~~ at ~~MLLW~~ MLLW and tenths of fathoms

REMARKS: Comments in black are made by the evaluator. Separates have been
removed and filed with the survey records.

✓ AWOIS + SURF PWD 2/88

SC 2-5-97

XWV



PROGRESS SKETCH

OPR-R184-RA-86
HYDROGRAPHIC SURVEY
TOGIAK BAY, ALASKA
JUNE 5 - AUGUST 31

NOAA SHIP RAINIER
CARL W. FISHER, CAPT., NOAA
COMMANDING

FROM CHART 160 II

JUNE	JULY	AUG.	
380.9	102.75	109	SQ.N.M. Sounding
773.0	9063	598	L.N.M. Misc. Distance
1370.7	13288	1500	L.N.M. Sounding
99	206	98	Bottom Samples (Grab)
6	1	3	Control Station (Electronic)
1	5	4	Temp., Depth, Sound Velocity
1	—	—	Nansen Cast
3	2	1	Tide Gages
2	—	5	Stations Located by Traverse
7	—	4	Water Samples Analyzed
—	0.7	—	SQ.N.M. Side Scan Sonar
—	21.5	—	L.N.M. Side Scan Sonar
—	—	—	SQ.N.M. Wire Drag
—	—	—	L.N.M. Wire Drag
16	12	1	Water Transparency Sta. (K-Meter)
4	3	1	Current Stations Occupied

A. PROJECT

A basic hydrographic survey was completed as specified by Project Instructions OPR-R184-RA-86, dated April 16, 1986 and Change Number 1, dated May 23, 1986. This survey was designated sheet U from the original sheet layout for the Bristol Bay survey project, dated January 25, 1985. The survey was assigned the Registry Number H-10219 (Field Number RA-20-2-86).

B. AREA SURVEYED

The survey was located in northeast Bristol Bay, Alaska; an area centered around Round Island in the Walrus Islands. The southwest Alaska mainland lies ten miles north of the survey. The area is characterized by a generally flat, gently sloping bottom broken only by the steeply-rising, rugged bottom immediately adjacent to Round Island. Round Island, and the waters in a two mile radius around the island, is a state game sanctuary for a large population of male Pacific Walruses which haul out on the shoreline during the summer months each year. The island is protected by the State of Alaska Department of Fish and Game. The survey area is also a major shipping route for vessels transitting to the rich fishing grounds at Togiak Bay, Nunavachak Bay, and Kulukak Bay. The survey was bounded by the following limits:

North - $58^{\circ} 40' 30''\text{N}$
South - $58^{\circ} 32' 30''\text{N}$
East - $159^{\circ} 46' 30''\text{W}$
West - $160^{\circ} 11' 30''\text{W}$

Data acquisition was conducted from June 28, 1986 to August 6, 1986 (DN 179 - DN 218).

C. SOUNDING VESSELS

Vessels used in this survey were:

<u>Vessel</u>	<u>EDP #</u>
RAINIER	2120
RA-3	2123
RA-4	2124
RA-5	2125
RA-6	2126

RAINIER, RA-3, RA-4, and RA-6 were used to collect range-range and range-azimuth hydrographic data. RA-5 was used only to collect bottom samples. No changes to the standard sounding configurations were necessary.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Echo Sounders

Each vessel used for this survey was equipped with a DSF-6000N echo sounder. All echo sounders were operated in the HIGH + LOW (HIGH DIGITIZED) function, using manual gain controls to obtain the best analog trace. Echo sounders functioned properly and remained in good working condition throughout the survey with the exception of that aboard vessel 2124, which was replaced midway through the survey because the "time zero" magnetic switch shorted out. The following table summarizes the serial numbers of all DSF-6000N instruments used.

<u>VESSEL</u>	<u>DSF-6000N SERIAL NUMBER</u>	<u>DAY NUMBERS</u>
2120	A103N	179-182
2123	A123N	182,190-199
2124	A115N A103N	180-182,190-191 192-199,218
2125	A117N	181,193,195,197
2126	A119N	190-194,197-199

The starboard midships transducer was used for sounding with vessel 2120 for the hydrography run with the ship. The transducer depth was measured with a pneumatic depth gage (S/N 8504192N) on 6 July 1986 while the ship was in port at Dutch Harbor. The measured depth of 2.2 fathoms agrees with RAINIER historical data. The transducers on the survey launches are mounted starboard midships. Transducer depths of 0.3 fathom for each of the launches were measured during the last winter inport and agree with historical data. Transducer installation locations on all the survey vessels are such that any sounding corrections apply to both the narrow and wide echo sounder beams.

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

Velocity Correctors

Velocity of sound through water and the associated corrections to echo soundings were determined by velocity probe casts using a Plessy/Grundy Sound Velocity Sensor (serial # 3444) coupled to a Hewlett-Packard 5315A Universal Frequency Counter (serial # 1946A03637). The Plessy/Grundy Velocity Sensor was last calibrated in March, 1985 by The Northwest Regional Calibration Center, Bellevue, Washington. ✓

Velocity correctors for this survey were applied on a leg by leg basis. A constant trend toward higher sound velocities throughout the summer was attributed to the seasonal affect of warmer water temperatures. The table below summarizes the velocity casts averaged and applied to each portion of this survey.

<u>PROJECT LEG&DNS</u>	<u>VESSEL NUMBER</u>	<u>VELOCITY CASTS AVERAGED</u>	<u>APPLICABLE DEPTHS(FM) AND CORRECTIONS(FM)</u>
2 179-182	2120	1 & 2	all depths/ 0.0 corr
2 182	2123	2	0.0 - 11.4/ 0.0 11.5 - 20.4/ 0.1
3 190-199	2123, 2124 2125, 2126	2,3 & 4	0.0 - 5.3/ 0.0 5.4 - 17.1/ 0.1 17.2 - 18.9/ 0.2 ✓
4 218	2124	5,6,7 & 8	0.0 - 3.2/ 0.0 3.3 - 9.6/ 0.1 9.7 - 16.9/ 0.2

Velocity casts were performed in areas of the deepest depths, and at other locations in the survey area. There was no indication of any change in the sound velocity due to location. Therefore, the shallow casts were averaged in with the deeper casts to produce the final velocity correctors for each leg of the project. The following table lists the velocity cast stations occupied during this survey.

<u>CAST</u>	<u>DEEPEST DEPTH (m)</u>	<u>DAY NUMBER</u>	<u>POSITION</u>
#1	30	172	58° 24.0'N, 159° 52.8'W <i>Plots off Sheet limits</i>
#2	35	183	58° 24.5'N, 159° 53.1'W " " " "
#3	20	195	58° 37.4'N, 159° 58.1'W
#4	25	204	58° 43.3'N, 159° 59.5'W
#5a	25	211	58° 43.8'N, 159° 59.8'W
#5b	10	211	58° 50.2'N, 160° 01.9'W <i>Plots off Sheet limits</i>
#6	25	219	58° 44.1'N, 159° 56.2'W " " " "
#7	10	220	58° 49.6'N, 160° 01.6'W " " " "
#8	25	225	58° 45.0'N, 160° 12.9'W " " " "

Settlement and Squat

A shallow water settlement and squat test was performed on the ship on 21 July 86 (DN 202) in the vicinity of Kulukak Point over an area of particularly flat bottom, approximately 7 fathoms deep. The ship navigated along a constant Loran C rate programmed into the bridge RAYNAV computer. As this trackline intersected each of five preselected consecutive Loran C rate readings, approximately 500 meters apart, an observation of the raw sounding depth was recorded. Speeds tested were idle, zero pitch (DIW); 100 RPM, 10 ft pitch; 160 RPM, 10 ft pitch; 180 RPM, 10 ft pitch; and 200 RPM, 10 ft pitch. Simultaneous tide gage readings were recorded at the Kulukak tide gage, and all soundings recorded throughout the settlement and squat test were normalized to the DIW tide gage reading. The echograms were scanned for sea action of 0.5 ft. ✓

A deep water settlement and squat test was performed on the ship on 8 August 86 east of Black Rock in a depth of approximately 16 fathoms. The same procedure was used as for the shallow water trial, and the results of both tests were averaged together to produce a final corrector of 0.0 fm for 100 RPM and +0.1 fm for RPMs greater than 100. ✓

Settlement and squat trials were performed on the survey launches (vesnos 2123, 2124, 2125, and 2126) on 8 AUG 86 (DN 220) in the vicinity of Summit Island in a depth of approximately 5 fathoms. Seas were flat and wind was calm as each launch, in turn, made successive runs toward and away from an observer positioned on a rock NW of Summit Island. With an elevation rod held vertical on deck directly above the transducer, observations were made with a Zeiss Ni2 leveling instrument (S/N 87102) as the launches were first DIW, then made passes at 700, 1000, 1200, 1500, 1800, 2000, 2200, and 2400 RPM. Five readings were recorded and averaged at each RPM tested. A temporary tide staff, installed at the location of the observer, was read concurrently with the level observations, and all elevations were normalized to a common tide height. A correction of -0.1 fm was found ✓

applicable to vessel 2124 for engine RPMs greater than 2000. ✓
All other launches require no settlement and squat
correction at any speed.

Soundings on the Final Field Sheet are not corrected for
settlement and squat. A TC/TI tape has been cut and ✓
submitted with this survey. Records of all settlement and
squat data are included in Appendix IV.

Tide Corrections

Tide correctors for this survey were provided by N/OMA12,
based on 1985 data from Black Rock, Walrus Island, Bristol
Bay, Alaska (946-5182). Soundings were rough plotted using
the Project Instructions' predicted time and height
correctors applied to Black Rock. These predicted tides
proved to be inadequate as evidenced by inconsistencies
observed when comparing mainscheme soundings with split and
crossline soundings. After analyzing tide data from the
Black Rock and Nushagak Peninsula gages, a supplementary
gage was installed at Round Island for 7 days and one tide
cycle was measured using the ship's echo sounder while the
ship was anchored in order to formulate a more suitable
corrector for the offshore area. The method for obtaining
the new zoning is discussed in detail in the Field Tide
Note. Soundings on the Final Field Sheet were plotted using
the following correctors applied to Black Rock predictions.

<u>APPLICABLE AREA</u>	<u>TIME CORRECTION</u>		<u>HEIGHT RATIO</u>
	<u>HIGH WATER</u>	<u>LOW WATER</u>	
N of 58° 38.0'N	-7 min	-7 min	0.98
S of 58° 38.0'N	-7 min	-7 min	0.93

E. HYDROGRAPHIC SHEETS

Two 1:20,000-scale plotter sheets designated RA-20-2N-86 and
RA-20-2S-86 were used to plot survey data. These sheets ✓
were prepared aboard the RAINIER using the PDP-8/e Hydroplot
system on a Houston Instrument Complot DP-3 roll plotter.
This computer system draws a modified transverse mercator
projection. Four expansion sheets were used to plot the
following special investigations:

Expansion #1

AWOIS Item 50885
(25 meter splits)

Expansion #2

Eastern shoreline
Round Island
(congested soundings)

Expansion #3

AWOIS Item 50909
(25 meter splits)

Expansion #4

AWOIS Item 50909
Side Scan Sonar
Investigation

All expansion sheets were plotted at 1:5,000 scale. The parameters which define these sheets can be found in Appendix I.

The central meridian, false easting, and controlling latitude were held constant for all field sheets.

The final field sheet and accompanying field records will be forwarded to the Pacific Marine Center for verification.

F. CONTROL STATIONS

All horizontal control stations established for this survey were positioned to Third Order Class I standards. All positions for stations established in 1948 were provided by NGS, and the positions for the remaining stations are unadjusted field positions.

The following stations were used in the completion of this survey:

<u>Signal #</u>	<u>Station Name</u>	<u>Date Established</u>
104	ROUND 1948	1948
105	BOO-BOO	1985
106	RIGHT HAND 1948	1948
107	FOG	1986
200	CROOKED 1948	1948
202	CROOKED 1948 AZ MK	1948

Station FOG (1986) was positioned by triangulation.

Station CAL POLE (1986) was established on the southeast corner of Black Rock for launch Mini-Ranger static systems checks. The station is an eye-bolt screwed into a drill hole. The station was positioned by traverse from Station FOG.

Station BOO-BOO (1985) was re-positioned due to the discovery of an error in the reduction of the EDM data from last year. A new distance was measured from station CROOKED 1948 and this was used with last year's data to compute a new traverse position for BOO-BOO.

The North American Datum of 1927 was used.

No unusual or non-standard survey methods were used.

For more information on horizontal control work for this survey, refer to the report, Horizontal Control Report for OPR-R184-RA-86.

G. HYDROGRAPHIC POSITION CONTROL

Soundings were located using range-range and range-azimuth geometry. Range data were acquired with Motorola's Mini-Ranger III electronic positioning system. Azimuths were measured using a WILD T-2 theodolite. In addition, the "See Field Sheet" method of positioning was used where electronic positioning was not available.

Positioning Equipment

Four Mini-Ranger console/RT pairs and five vessels were used during this survey. The following table lists the days of use and corresponding vessel for each console/RT pair.

<u>Console/RT pair</u>	<u>DN</u>	<u>EDP #</u>	<u>Vessel Name</u>
715/911615	179-182 ³	2120	RAINIER
720/B1405	182-199,212	2123	RA-3
715/911615	182-199,218	2124	RA-4
711/C1712	192-197	2125	RA-5
B0269/B1388	190-199 ²⁰⁴	2126	RA-6

Along with these console/RT pairs, six shore transponders were used:

<u>Code</u>	<u>Serial Number</u>
0	O1789
1	C1883
3	911635
B	B1412
E	911721
F	911711

See Appendix V for location of transponders and days used.

The T-2 theodolite used to measure azimuths while running range-azimuth had serial number 57259.

Calibrations and System Checks

Four console/RT pairs were calibrated to all six transponders over a baseline on Lake Union in Seattle,

Washington in May, 1986. The table below lists the project's original vessel-console/RT configurations.

<u>Console/RT pair</u>	<u>EDP #</u>
715/911615	2120
720/B1405	2123
713165/911102	2124
B0269/B1388	2126

From this baseline calibration, signal strength cutoffs and correctors were developed. Throughout the survey these correctors were confirmed with critical and noncritical system checks in accordance with PMC OPORDER, Appendicies M and S.

On day 182, the console/RT pair, 713165/911102, in vesno 2124 failed and was replaced with vesno 2120's pair, 715/911615. An uncalibrated console (s/n 711) was sent to the RAINIER and paired with a spare RT unit (s/n C1712) onboard. The new console was not calibrated due to the inaccessabilty of the shore transponders. The console/RT pair was installed in vesno 2125 and used to collect bottom samples. No soundings in this survey were acquired with the console/RT pair, 713165/911102.

A final baseline calibration will be conducted over the Lake Union baseline upon the RAINIER's return to Seattle. If the derived correctors differ from the initial calibration by less than five meters, the initial correctors will be retained. If the final values differ by more than five meters, mean correctors will be calculated. The final field sheet plotted onboard the RAINIER was plotted using the initial baseline correctors. *Reference Electronic Control Report DRC-R104-88-06 pg 15. Closing correctors did not differ. During baseline correctors maintained.*

Critical system checks were conducted at least once a week, primarily using the theodolite intersection method. In addition, the fixed point observation technique was also used. Station CAL POLE was used as the fixed point during these checks. An abstract of correctors derived from these system checks can be found in Appendix V.

Noncritical system checks were conducted daily. The launch to launch method was the primary technique used. In all cases, the observed values fell within the specifications allowed by PMC OPORDER Appendix M.

Positioning Techniques

Range-range geometry was the principle method of locating soundings throughout this survey. Both ship and launch were used to acquire soundings. No unusual techniques were employed.

Range-azimuth geometry was used by ship and launch in an area near the south shore of Round Island. Range-range positioning could not be used in this area. When running hydrography with the launch, mainscheme arcs from stations CROOKED AZ and RIGHT HAND were run perpendicular to shore. On both set-ups, visibility was lost to the range-azimuth station on the inshore end of the arc. When this occurred, the helmsman maintained the arc by magnetic compass until the line could be broken near shore. Where the line was broken, references were made to manuscript features on shore. From this "See Field Sheet" data, azimuths were interpolated to construct fixes, positioning the inshore end of the line. This reconstruction of fixes amounted to three fixes and six soundings at the end of a line in the worst case. These positions are noted on the Abstract of Positions (Appendix VII).

Bottom samples were located using Loran-C and Mini-Ranger position control. Forty of one-hundred and twenty-four samples were positioned with Loran-C rates. These samples were plotted by converting Loran-C position to Mini-Ranger rates.

Problems and Unusual Position Configurations *SEE EVALUATION REPORT SECTION 2*

The RAINIER was not able to establish control stations on the south end of Round Island because of reservations expressed by the Alaska Department of Fish and Game Observer concerning the potential disturbance to the walrus. The beaches in this area are abundant with walrus and an extensive effort along the shore would have been necessary to locate horizontal control stations. As a result, a small amount of data was acquired using "See Field Sheet" techniques.

On DN 194, EDP # 2123, seven soundings from the third intermediate after fix 3748 through fix 3750 were run inside the banana between stations RIGHT HAND and ROUND. The angle of intersection was greater than 150° for these positions.

On DN 198, EDP # 2124, four fifty meter split lines, amounting to 3.9 miles, were run inside the banana between stations BOO-BOO and ROUND. From fix 7232 through fix 7256, the angle of intersection ranged from 156° to 159° . These data were part of AWOIS item number 50885 and were part of the development designated "Not for Smooth Plot".

Mini-Ranger range holes presented major problems during periods of data acquisition. As a rule, the frequency of range holes increased with distance from a Mini-Ranger shore station. Typically, the vessel was on line receiving strong signals and steady signal strengths. Then, the console would stop receiving one of the stations. The vessel maintained course and speed, and after a brief period, the

station would come back on the air^{Null Zones} with steady signals. Upon coming out of the range hole^h, the vessel was generally within twenty meters of the line. A distance of four centimeters on the field sheet was the maximum distance allowed for time and course fill-ins, in accordance with the Hydrographic Manual. This is equivalent to nine soundings at the scale of the survey. Gaps greater than four centimeters were rerun. While these range holes occurred on both ship and launch, the problem was more prevalent with the ship system. During the later part of the survey data acquisition was done strictly by launch. Range holes were filled in by rerunning that portion of the line at a different stage of tide, with a different vessel, or with different control.

On occasion, fixes were acquired with signal strengths below cutoff. In such cases, position data were rejected and the soundings were located by time and course. These low signal strengths occurred infrequently throughout the survey area. However, on DN 199, with vesno 2126, 3.4 miles of a crossline (fix 9143 - fix 9154), located in the northeast portion of the survey were rejected due to below cutoff signal strengths from station FOG (code 3).

On day 182, a theodolite intersection critical system check indicated console 713165 had lost calibration. Discrepancies of twenty meters or more were observed on the four transponders checked. Upon bench testing the console/RT pair, a power supply and modulator in the RT unit were found defective. Due to the absence of critical system checks during a two day period, three days of hydrography (180-182) were rejected. No data in this survey were acquired using console 713165.

Andist

The ANDIST on vessel 2120 was 000 degrees, 6.6 meters. The starboard midship transducer was used to acquire soundings. The RT unit was located at the top (elev. 77 ft.) of the forward mast. On vessels 2123, 2124, 2125, and 2126 the RT is located over the transducer with an ANDIST of 0,0.

Refer to the Electronic Control Report, OPR-R184-RA-86 for additional information.

H. SHORELINE

Shoreline details on the field sheet were transferred directly from NOS shoreline manuscript:

TP-01191
ALASKA
TOGIAK BAY TO CAPE CONSTANTINE
ROUND ISLAND

This manuscript is a transverse mercator projection at 1:20,000 scale.

All shoreline details have been verified by use of the following three methods: *SEE REPROCESSING REPORT SECTION II PARAGRAPH C.*

- a. Detached positions
- b. Reference numbers (as directed in PMC OPORDERS Appendix P Sec. I.A.)
- c. Annotations made on data printouts during visual inspection of shoreline features at the termination of survey lines inshore.

Shoreline details and features have been transferred to the field sheet. Additions were shown in black and changes were shown in red. There were no areas where shoreline verification was not accomplished and shoreline manuscripts were completely adequate. The following table summarizes changes and additions to the manuscript that were found in the field.

CHANGE

<u>POSITION NO.</u> <u>REFERENCE NO.</u>	<u>GEOGRAPHIC</u> <u>POSITION</u>	<u>FEATURE</u>
6949	58° 36'30.51"N 159° 59'27.52"W	Islet bares 22 ft. MHW (change from rock)
3078 58°36'55.53"N, 159°39'15.40"W		ISLET BARES 5 FT AT MLLW MHW
3079 58°36'59.79"N, 159°39'17.81"W		ISLET BARES 5 FT AT MLLW MHW

ADDITIONS

<u>POSITION NO.</u> <u>REFERENCE NO.</u>	<u>GEOGRAPHIC</u> <u>POSITION</u>	<u>FEATURE</u>
6948	58° 36'40.41"N 159° 59'40.98"W	Rock in foul area bares 3 ft. MLLW (add foul area)
6952	58° 36' ^{50.72} 53.31 "N 159° 59' ^{37.24} 36.50 "W	Rock in foul area bares 3 ft. MLLW (add foul area)

6953	* (2)	58° 36' 50.18" N 159° 59' 37.05" W	Rock in foul area bares 3 ft. MLLW (add foul area)
6957	* (2)	58° 36' 21.49" N 159° 59' 14.43" W	Rocks in foul area bares 4-10 ft. MLLW
6958	* (2)	58° 36' 19.71" N 159° 59' 12.74" W	"
6961	* (2)	58° 36' 07.27" N 159° 59' 06.25" W	"
6962	* (2)	58° 36' 04.72" N 159° 59' 00.79" W	"
412	SAME as PHOTO - MANUSCRIPT Rock	58° 36' 03.89" N 159° 58' 59.79" W	"
7354	* (1)	58° 36' 02.52" N 159° 58' 58.81" W	"
7355	* (10)	58° 35' 57.91" N 159° 58' 54.63" W	"
7357	* (3)	58° 35' 50.90" N 159° 58' 48.37" W	"
7358	* (2)	58° 35' 38.59" N 159° 58' 44.99" W	Two rocks in foul area bares 2 ft. MLLW (add two rocks and foul area)
7359	(alt to code 678)		Rock bares 4 ft at MLLW
7360	* (4)	58° 35' 33.11" N 159° 58' 36.60" W	

In accordance with the Hydrographic Manual (Figure B-2), rocks that bared more than 2.6 feet over MHW are shown on the field sheet referenced to MHW. All rocks which did not bare at MHW are referenced to MLLW. Based on predicted tide data MHW was estimated to be 10.0 ft.

No control stations were located seaward of the shoreline.

The most significant shoreline feature surveyed was a gravel spit extending off the north end of Round Island. An uncharted rock that exposes 5.8 ft. at MLLW, and covers at mid and higher tides, was found on the spit. It is located 0.2 nautical miles on a bearing 333° T from the northwest tip of the island, its geographic position determined by Mini-Ranger fix:

Position # 6994

58° 37' 13.60" N
159° 59' 45.54" W

A Danger to Navigation letter and message were submitted for this feature, copies of which can be found in Appendix XI. Further discussion of this feature can be found in Section K.

Shoreline manuscript TP-01191 was compared to a prior photogrammetric survey:

U.S. COAST AND GEODETIC SURVEY
TOPOGRAPHIC MAP
T-9253
ALASKA
WALRUS ISLANDS
ROUND ISLAND

This polyconic projection (1:20,000 scale) compared well to the contemporary manuscript. Map T-9253 depicts ledges along areas of the shoreline where this survey verified TP-01191 manuscript rocks. The hydrographer considered the depiction of ledges rather than rocks, as is currently shown on Chart 16315, an adequate representation of shoreline at the chart scale 1:100,000.

The hydrographer also noticed, from T-9253, that a rock on the spit north of Round Island was occupied as Station MEAT (1947). That station position coincided with detached position #6944 of this survey reported as an uncharted rock awash, exposed 5.8 feet at MLLW (see Appendix XI - Dangers to Navigation). The rock was never carried forward from prior survey H-7718 to Chart 16315 as a dangerous rock awash. *CHART AREA AS SHOWN ON SHORE SHEET*

I. CROSSLINES

A total of 90.4 nautical miles of crosslines were run. This is equivalent to 9.7 percent of the total mainscheme hydrography. In all cases, crossline soundings agreed with mainscheme soundings within five tenths of a fathom. The following table lists the agreements of soundings for a sample of 66 comparisons made across the sheet.

CROSSLINE AGREEMENT

soundings within 0.1 fathom : 74%
soundings within 0.2 fathom : 82%
soundings within 0.3 fathom : 92%

The disagreements which exist are accountable for two reasons. Significant differences in real and predicted tides are likely to exist across the sheet. The bottom over the entire survey area, except immediately adjacent to Round Island, is flat, and any difference in real and predicted tides (on the order of 0.1 to 0.5 feet) would produce the

observed discrepancies in soundings. Some discrepancies which exist on the southern half of the sheet can also be attributed to the fact that settlement and squat correctors for RAINIER and survey launch RA-4 (the only vessels requiring correctors) have not been applied to the final field sheet soundings. RAINIER and RA-4 ran mainscheme lines which were later crossed by the other launches.

J. JUNCTIONS

This survey junctions with four contemporary surveys.

JUNCTION SURVEYS

<u>Registry No.</u>	<u>Scale</u>	<u>Year</u>	<u>Location</u>
H-10188	1:20,000	1985	south junction
H-10216	1:20,000	1986	south junction
H-10222	1:20,000	1986	northwest junction
H-10220	1:20,000	1986	north junction

The surveys H-10216, H-10220, and H-10222 were conducted concurrently with this survey. Data acquisition was continuous throughout this group of field sheets. No irregularities were found with soundings or depth contours at the junction points of these sheets and all junctions were excellent.

The following table lists the agreement found between junction soundings on H-10188 and this survey based on a sample of 20 comparisons.

JUNCTION AGREEMENTS

<u>Survey</u>	<u>within .1 fm</u>	<u>within .2 fm</u>	<u>within .3 fm</u>
H-10188	67%	94%	100%

Excellent junctions were achieved and minor differences were attributed to errors in predicted tides utilized in this survey.

K. COMPARISON WITH PRIOR SURVEYS

One AWOIS Item #50909, with origins from prior survey H-7718, was located within the limits of this survey.

AWOIS ITEM 50909

Charted Features: Spit and rocks awash

General Locale: Charted spit extends approximately 1.2 miles in a NW direction from Round Island. Three rocks awash are charted in close proximity to the spit. A 1.5 fathom depth is also charted west of the spit.

Method of Referencing Items: There are five distinct features which make up this item. For clarity, a chartlet has been constructed showing the lettering system used to reference each feature. Each feature will be identified using the following letters:

<u>Letter Reference</u>	<u>Feature</u>	<u>Position</u>
A	Charted rock awash	58/37/2 ⁷ 0 N 160/00/35 W
B	Charted 1. ³ 5 fm depth	58/37/45 N 160/01/10 W
C	Charted rock awash	58/38/0 ³ 6 N 160/01/00 W
D	Charted dangerous rock awash	58/38/08 N 160/00/00 W
E	Uncharted rock awash (on manuscript)	58/37/13.60 N 159/59/45.54 W

AWOIS Item Source: Item A, the rock awash, and item B, the 1 fm 3ft (1.5 fm) originate from prior survey H-7718, a 1:100,000 reconnaissance survey performed by the PATHFINDER in 1948. As stated in the source document, no position number is evident on the rock and the entire area is sparsely sounded.

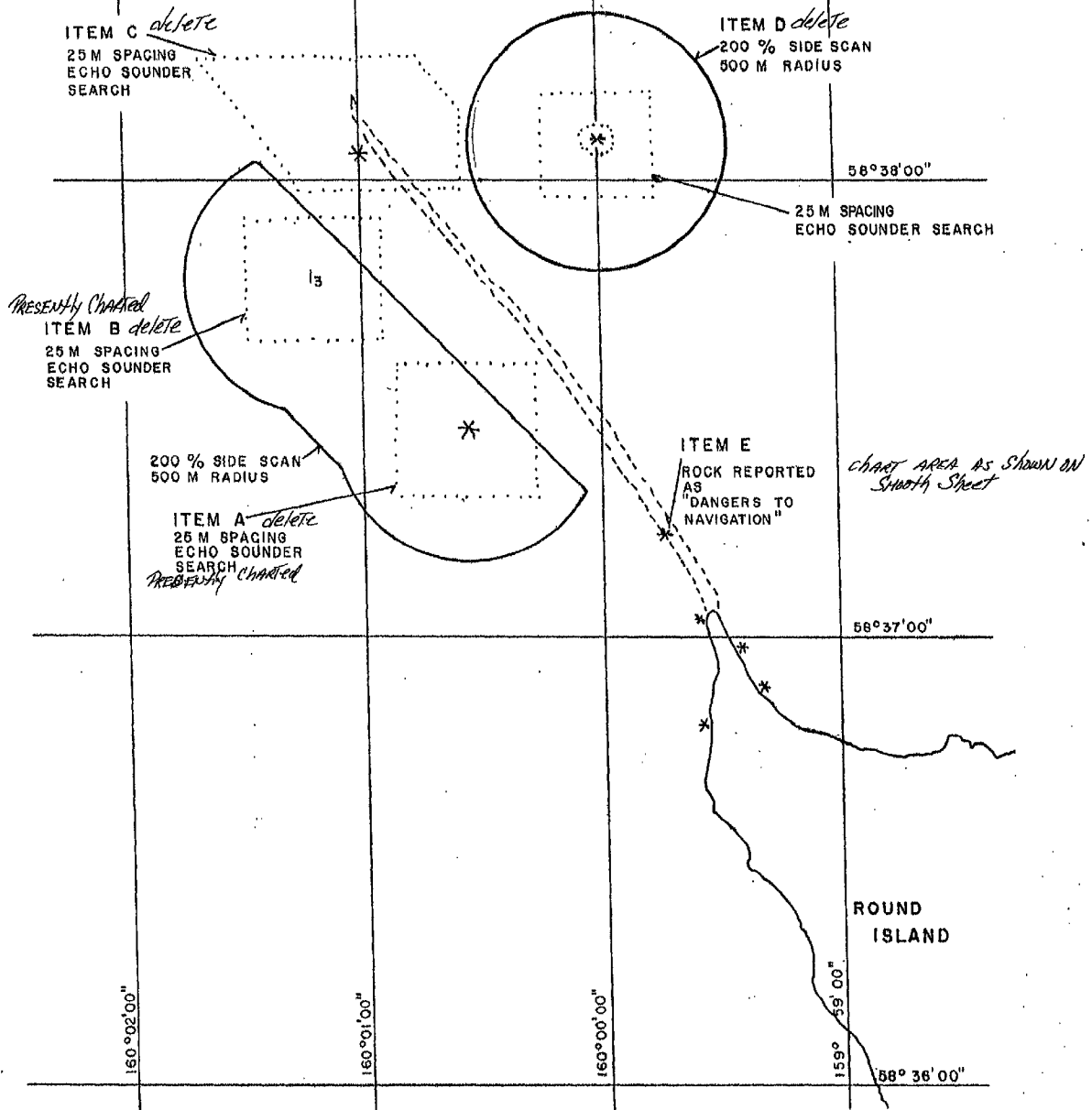
Item C, the rock awash at the end of the spit has as its source a Notice to Mariners report, NM18/85. The AWOIS description states that it is a representation of the northernmost extent of the "sandbar."

A source for Item D, the dangerous rock awash, was not furnished.

Method Of Investigation: The existence and extent of the charted spit was verified by splitting the mainscheme lines during periods of high water. Three lines were also run along the axis of the spit. One axis line and all 100 meter splits are shown on the final field sheet. Expansion sheet 3 also

OPR-R184-RA-86
SHEET U
H-10219
1:20,000

AWOIS 50909



shows detailed soundings over the spit. RAINIER spent a significant amount of time working and anchored near the spit and was able to observe the area at all tide levels. ✓

The spit is composed of rounded boulders averaging about one-half foot in diameter. The apex of the spit, which is about 10-20 meters wide, has depths of less than one fathom for most of its length. During most days in the project area, white water in the form of breakers occurred along the entire length of the spit at periods of low water. During days when no waves were present, strong currents were noted in the area. Depths west of the spit show a gradual dropoff to deeper water, whereas depths to the east show a steeper slope. No significant features were found on either side of the spit, although there appears to be a slight ruggedness of the bottom on the west side while the east side shows an extremely smooth bottom. ✓

The most significant feature observed in the area is the rock which is represented on shoreline manuscript TP-01191. It was verified by position 6944, DN 198, vesno 2126. The rock exposes 6 ft at MLLW and is submerged at mid and higher tide levels. This rock's position is given in Item E above. ✓ It was felt that this rock is a significant feature. Therefore, a Dangers to Navigation Report and Local Notice to Mariners was issued on this item.

In order to disprove the three charted rocks and the 1 fm 3 ft charted depth, an echo sounding search with line spacing reduced to 25 meters was performed within a 200 m radius of the positions of three features. Information on these echo sounding searches follow. All were done by VESNO 2126. ✓

<u>ITEM</u>	<u>DN</u>		<u>POSITIONS</u>
A	199	<i>NSP</i>	9082-9130
B	1989 199	<i>NSP</i> <i>NSP</i>	6984-6999, 9000-9003 <i>NSP</i> 9057-9081
C	197 199	<i>NSP</i> <i>NSP</i>	6896-6910 9004-9056
D	197 197	<i>Plotted</i> <i>NSP</i>	6915-6943 ²⁰ 6922-6943

In all of the above echo sounding searches, no evidence of a feature was found. Development depths agreed well with mainscheme and split depths, as shown on the final field sheet. Fifty and twenty-five meter splits are shown on Expansion 3 and have been designated "Not for Smooth Plot." ✓ One hundred meter splits are shown on the final field sheet.

Side Scan: In order to make thorough disprovals of the charted features, a side scan investigation was carried out in accordance with the Provisional Side Scan Sonar Manual, dated April 25, 1986. It should be noted that the new manual requires 200% coverage of a specified area in order to disprove an item, whereas the project instructions called for 400% coverage. In separate telephone calls, RAINIER's Field Operations Officer was advised by CDR Gerry Mills of the Program Services Division, PMC and by LCDR Andrew Armstrong of the Operations Branch, NCG in Rockville, MD that the provisional manual should take precedence over requirements stated in the project instructions. ✓

The instrument used during the side scan investigations was a Klein Hydroskan two channel recorder, model 521T (sn 254). The towfish was also made by Klein (sn 410M). The unit was tuned and operated according to the manufacturer's specifications. As required by the Provisional Manual, a "confidence check" was performed several times during the day on each channel. At the beginning of the day, the confidence check was performed by receiving a return on the hull and anchor chain of the RAINIER. During the latter part of the day, confidence checks were acquired by towing the fish close to the north and east end of the spit. Confidence checks are marked clearly on the sonargrams. During the entire day, operators had high confidence that the unit was well tuned and operating properly. ✓

Items A and B were grouped together and investigated as one scheme while a second scheme was run over Item D. Both investigations were performed on DN 212 by VESNO 2123. In both investigations, a range scale of 100 meters, and a 75 meter track spacing were selected in order to achieve the required 200% coverage. Lines controlled by the hydroplot system in the range-range mode, were run over both items in a 135 T-315 T orientation. A line spacing of 75 meters was chosen in accordance with Section 2.1.3.2 of the Provisional Manual. In this section, the following equation is given: ✓

$$LS (max) = 2RS - .002 (SS-1) -.05RS$$

RS = Range Scale in meters = 100 meters

SS = Achievable Survey Scale = 1:10,000 (Mini-Ranger, range-range) ✓

LS (max) = Maximum permissible line spacing in meters for 100% coverage = 175 meters

LS (max) for 200% coverage = 87.5 meters.

In order to achieve the maximum "effective scanning range" of 100 meters, the towfish height above bottom was maintained between 8 and 20 percent of the 100 meter range ✓

scale. In the scheme covering Item A-B, this required towfish heights to be very near the surface as depths in this area shoaled to about 5 fathoms. ✓

In the combined A-B scheme (pos 8121 to 8302), 200% coverage within a radius of 500 meters, was achieved to the west, northwest, south, and southeast of the two charted features. The area about 200 meters northeastward from the two features to the spit could not be covered by side scan due to the depth being less than 4 fms. The side scan instrument was well tuned during this investigation as the textured bottom can be interpreted on the sonargram. As the tracks get closer to the spit, more relief is seen on the trace. There were no contacts recorded on the sonargram which would indicate the features searched for. ✓

In the scheme covering Item D (Pos 8311 to 8412), the entire area within a 500 meter radius of the charted position was run with 200 % coverage. No contacts were found. ✓

Expansion sheet 4 shows a position plot of the vessel and the area covered by both side scan searches.

Conclusions And Recommendations: The charted rock awash and 1 fm 3 ft depth represented by Items A and B, respectively, should be deleted based on RAINIER's echo sounding and side scan investigations. Close inspection of the 1948 reconnaissance survey (H-7718) shows that the rock and 1.5 fm depth were located within the contours of the spit. RAINIER strongly believes that the geographic positions of the spit, the rock awash, and the 1.5 fm depth are all in error on the 1948 survey. We believe that the rock shown on the 1948 survey is in fact the rock described in the current survey as Item E. It appears that the geographic positions of the rock and the 1.5 fm depth were transferred from the prior survey onto the new chart directly, without taking into account their relative orientation to the spit. The spit's position on the current chart is accurate since it was compiled from the 1950 aerial photography. CONCUR

It is not clear to the RAINIER from the AWOIS source writeup where the rock symbol at the end of the spit originated in Item C. We believe that it may have been reported as a rock by someone who noticed waves breaking along the spit. Based on the 25 meter spacing echo sounder search and numerous visual inspections at low water, it is recommended that the rock symbol be deleted. CONCUR

The charted dangerous rock represented in Item D was disproven conclusively by an echo sounding and side scan search. It is recommended that it be deleted from the current chart. CONCUR

It is recommended that the manuscript rock in Item E be charted. *at Latitude 58°37'13.60"N Longitude 159°59'45.54"W* CHART AREA AS SHOWN ON SP1000th Sheet CONCUR

Comparison

This survey was compared with one prior survey.

Registry No.	: H-7718
Scale	: 1:100,000
Year	: 1948

A sample of prior survey soundings was used for the comparison. Agreements fell within the following limits:

soundings within .1 fm	: 37%
soundings within .5 fm	: 77%
soundings within 1.0 fm	: 87%
soundings within 1.3 fm	: 99%

No significant disagreements were found in the comparison, with the exception of the orientation of the spit extending northwest from Round Island. Where soundings overlap between the surveys there was good agreement.

The 1948 survey was a reconnaissance survey, conducted at a smaller scale and with less detail than survey H-10219. Soundings are sparse and depth curves are not adequately depicted. Survey H-10219 provided a greater concentration of soundings supporting a more accurate depiction of the depth curves.

The bottom throughout the survey area was found to be flat and regular, broken only by the steeply-rising shoreline of Round Island, and associated spit extending seaward on the north end of the island (see discussion of AWOIS item #50909 in this section for further details on the charted spit). Shoalest open-water depths of 4 to 5 fathoms were found in the extreme northwest corner of the survey area, with a downward slope of 1 fathom in two miles towards the southwest corner, reaching 9 fathoms. The primary downward slope of 1 fathom in one mile was observed from the western sheet limit (5 fathoms of water) toward the eastern limit (15 fathoms of water). The deepest water in the survey was found in a half mile diameter area centered 0.5 nautical miles northeast of Round Island, in depths of 17 fathoms. A sharp upward slope, 1 fathom in every half mile (from 15 fathoms to 9 fathoms), was discovered in the extreme northeast corner of the area. Depth of water adjacent to the island, to within 200 meters, generally was found to be 3 to 4 fathoms except in the immediate vicinity of the spit. Splits of mainscheme sounding lines were conducted around the island to ensure that no undiscovered shoals or obstructions were present. Fine green sand comprised the bottom across the survey area.

Standard depth curves of five and ten fathoms are depicted on the final field sheet. Supplemental curves in one fathom intervals are drawn at depths less than ten fathoms. At depths greater than ten fathoms, the curves are drawn at two fathom intervals. The six fathom supplemental curve was drawn in green ink. All other supplemental curves were drawn in brown ink on the final field sheet. ✓

The pattern of depth curves throughout most of the survey area was more irregular than should occur where the bottom is so flat. These irregularities can be explained by two reasons. Small changes in the depth determined when scanning records with sea action can cause horizontal displacement of depth curves. Also, small errors in predicted tides caused minor irregularities in the contours where adjacent mainscheme lines were run at different stages of the tide. ✓

L. COMPARISON THE WITH CHART

This survey was compared to the following charts:

<u>Chart Number</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16011	1:1,023,000	30 th	4/2/83
16315	1:100,000	1 st	3/9/85

 ✓

Danger to Navigation Reports

Two Danger to Navigation Reports pertaining to this survey area were filed, the first on August 5, 1986 and the second on September 24, 1986. Copies of these reports can be found in Appendix XII. A detailed description of the first feature (filed August 5) can be found in Section K. (AWOIS Item #50909) of this report. Details of the second danger (filed September 24) can be found in the "Shoal Investigations" portion of this Section L. ✓

Comparison

All charted soundings within the limits of the survey, a total of 22, were used for this comparison. Agreements were found to be within 1.5 fathoms (in all but two cases) and fell within the following limits: ✓

soundings within .1 fm	:	18%
soundings within .5 fm	:	64%
soundings within 1.0 fm	:	82%
soundings within 1.5 fm	:	91%

The following table details two cases in which discrepancies larger than 1.5 fm were found:

	<u>Chart Number</u>	<u>Charted Depth (fm)</u>	<u>Survey Depth (fm)</u>	<u>Charted Position</u>
1.	16011	8	10.3	58° 40' 24" N 160° 02' 24" W
	16315	8	10.3	58° 40' 12" N 160° 02' 24" W
2.	16315	1.3	5.3	58° 37' 45" N 160° 01' 06" W

In the first disagreement, the origin of the charted 8 fathom depth is prior survey BP 18063/1916. This prior survey was not available for comparison. Prior survey H-7718 shows a 10.3 fathom sounding at this location on the survey and near this position on the charts. The bottom was found to be very regular and gently sloping with depths of 10.0 to 10.5 fathoms at this location. Due to the extensive coverage of soundings obtained in this survey, and the small scale of both charts, it is recommended that the survey depths supercede the charted depths in this area. ✓

The location of the second disagreement is in the vicinity of the charted spit north of Round Island. For a detailed discussion of this area refer to section K. (AWOIS Item #50909) of this report. ✓

AWOIS ITEM 50885

AWOIS Item #50885 was the only item in the survey area which originated with non-NOS sources:

CL722/81 - State of Alaska, Department of Fish and Game
Shoaling reported, R/V 92 feet long struck
bottom, LAT 58° 36' 15"N, LON 160° 05' 41"W
(computed from LORAN C rates 9990-Y-32728.0;
Z-46094.0). Ship Captain indicates 7.5 fms
in this locale. (Entered 5/85 RWD). ✓

Survey requirements called for this obstruction to be verified or disproved by a full echo-sounder/side scan sonar investigation within a 1000 meter minimum radius, with line spacing reduced to ensure adequate bottom coverage for disproval.

On DN 180 RAINIER (vesno 2120) surveyed 50 meter splits within a 1000 meter radius of the item location since there was no indication of any obstruction in the mainscheme soundings and the bottom was extremely regular. These sounding data were recorded as fix #1745 through #1893. Launch RA-4 (vesno 2124) returned to the location on DN 197 (fix #7065 - #7225) and DN 198 (fix #7226 - #7288) to survey 25 meter splits within a 1000 meter radius of the reported obstruction. All soundings and positions were acquired in a range-range survey mode.

A 1:5,000 scale expansion sheet (Expansion #1) was produced from these data. The bottom was found to be flat and featureless with depths of 7.34 fathoms in the southwest sector of the circle, gently sloping to 8.4 fathoms in the northeast sector. No shoaling was discovered and least depths of 7.34 fathoms were found in the investigated area near the following location: *Position #1772/3*

00.46"
58° 36' 00"N
160° 06' 48"W
16.60'

Based on the results of this investigation and disproval of the obstruction, it is recommended that this reported shoal be removed from charts 16011 and 16315 at the following charted positions:

<u>Chart Number</u>	<u>Position</u>
16011	58° 36' 06"N 160° 05' 00"W
16315	58° 36' 12"N 160° 05' 48"W

Shoal Investigations

A shoal investigation was conducted around a significant least depth sounding of 7.87 fathoms at the following location:

Position
#7105/3 *31.29"*
58° 38' 34"N
160° 04' 17"W
15.59"

The sounding was in an area approximately 2 nautical miles northwest of the charted spit north of Round Island. The bottom in that region was characterized as regular and gently sloping, from 9.8 fathoms west of this least depth to 8.5 fathoms toward the east, over a distance of 0.5 nautical miles.

Launch RA-4 (vesno 2124) found this feature between the fourth and fifth intermediate soundings after fix #2174 while surveying mainscheme lines on DN 180. Launch RA-6

(vesno 2126) returned to this area and surveyed 50 meter splits to the north and south of the feature, recorded as fix #9179 - #9190 on DN 199.

Position # 9185/3 Lat/Tide 58°58'31.29"N
Longitude 160°04'15.59"W

This investigation determined 7.87 fathoms to be the least significant depth on a relatively flat bottom with average depths of 8.3 fathoms immediately surrounding. The sounding is an extension of a minor feature which rises 0.5 fathoms above the bottom and trends southeast approximately 0.4 nautical miles. It is recommended that survey depths supercede charted depths in this area. *Contour*

Another shoal sounding of 1.07 fathoms, most likely a rock pinnacle, was found at the following location:

Position # 4560/1
58° 35' 32.97"N AWOIS 50914
159° 58' 47.59"W
.60'

This feature was discovered by launch RA-4 (VESNO 2124) on DN 190, approximately 0.18 nautical miles west of the south tip of Round Island, 0.1 nautical miles offshore. The pinnacle was recorded as the first intermediate sounding after fix #4560 during range-azimuth, 100 meter splits survey nearshore. The feature was found on a steeply-rising, rugged bottom. Depths immediately seaward of this sounding were 5 to 6 fathoms, and 2 to 3 fathoms just shoreward.

The presence of this peak was noticed during the post-processing phase of survey operations. RAINIER had already departed the survey area. A Danger to Navigation Report has been filed and copies of this report can be found in Appendix XII. The hydrographer considers this feature significant and recommends that a diver investigation be conducted at this location during the next field season in Bristol Bay. *SEE EVALUATION REPORT SECTION 9*

Non-Sounding Features

There were no charted non-sounding features in the survey area.

Recommendations

No changes to scale, coverage, or format of the published charts for this survey area are recommended.

Through both personal meetings and VHF radio contact with pilots and fishermen working in the survey area, it was learned that the new provisional chart 16315 has been very well received. Chart users in the north Bristol Bay region eagerly await the addition of these survey data on the next edition of provisional 16315.

M. ADEQUACY OF SURVEY

This survey is the first basic survey to be conducted over this area. The prior survey was reconnaissance only. This survey is complete and adequate to supercede the prior survey, with the exception that further investigation is required on a nearshore pinnacle mentioned in Section L. of this report. ✓

In obedience with the project instructions (Sec 1.8) and state officials stationed on Round Island, the inshore limit of sounding was kept 200 meters offshore along some parts of the shoreline, particularly the north and east coasts, where Pacific Walruses were hauled-out in large numbers throughout the survey period. ✓

Shadow zones in the electronic control existed in places immediately adjacent to Round Island, and "see-field-sheet" method of positioning was employed. This is discussed in detail in Section G. of this report. ✓

There are some areas of the survey where sounding lines exceeded 200 meter spacing, particularly in a region due south of Round Island. This was attributed to helmsmen steering the survey vessel off-course of the intended line. Due to the flat characteristic of the bottom in those areas, the need for splits was not deemed necessary. ✓

N. AIDS TO NAVIGATION

There were no aids to navigation in the survey area. ✓

O. STATISTICS

<u>EDP NO.</u>	<u>NUMBER OF POSITIONS</u>	<u>NAUTICAL MILES OF SOUNDING LINES</u>
2120	1995 / 1880	557
2123	1174 / 1035	191
2124	934 / 730	176
2126	1172 / 948	299
2125	88 / 123	-
TOTAL	5363 / 4786	1223

SQUARE MILES OF HYDROGRAPHY	:	180
BOTTOM SAMPLES	:	124
TIDE STATIONS	:	5
CURRENT STATIONS	:	1
VELOCITY CASTS	:	9
DAYS OF PRODUCTION	:	17
NAUTICAL MILES SIDE SCAN	:	21.5

P. MISCELLANEOUS

A fourteen hour current observation was made 0.9 nautical miles northeast of Round Island at the following location:

58° 37' 42" N
159° 57' 48" W

The current was observed to be generally reversing, flooding at approximately 250°T and ebbing at approximately 130°T. The highest current speed observed was 0.8 knots during the ebb. Additional observations were made on adjacent survey sheets and can be found in the Current Report which will be forwarded to N/CG241.

Water clarity observations were made in the region of this survey and can be found in the Water Clarity Report which will be forwarded to N/CG241.

Bottom samples have been submitted to the Smithsonian Institute.

Fixes were simultaneously acquired with Loran-C and Mini-Ranger control throughout most of the survey. Due to computer problems, it was not possible to acquire Loran-C rates over the entire survey area. The Loran-C chain available in the area is the 9990 chain, using the Y and Z secondary station type Lines of Position. Loran-C control was compared to Mini-Ranger control by converting Mini-Ranger rates to a geographic position and plotting the Loran-C coordinates. On the average, these comparisons show the Loran-C position .07 nautical miles southwest of the Mini-Ranger position.

During conversation with the State of Alaska Department of Fish and Game observer on Round Island, Ms. Judy Shoenburne, we learned of the department's ardent desire to have a two nautical mile limit (designating the marine sanctuary for

Pacific Walruses) printed on any charts for this area. Due to the relatively large amount of vessel traffic in the vicinity of Round Island during the summer haul-out of walruses, we concur that a two mile vessel exclusion zone be charted. The State of Alaska Department of Fish and Game is expected to initiate this request directly to the Assistant Administrator for Ocean Services and Coastal Zone Development, NOAA.

Q. RECOMMENDATIONS

The hydrographer considers field work on this survey to be complete except for further investigation of a pinnacle near the southwest shoreline of Round Island (as discussed in Section L. of this report).

R. AUTOMATED DATA PROCESSING

Data acquisition and processing were accomplished with a PDP 8/e Hydroplot computer system. The following is a list of programs used to carry out the acquisition and processing.

<u>Number</u>	<u>Description</u>	<u>Version</u>
RK 112	HYPERBOLIC, R/R HYDROPLOT	3/01/86
RK 201	GRID, SIGNAL, AND LATTICE PLOT	4/18/75
RK 211	RANGE-RANGE NON-REAL TIME PLOT	2/13/84
RK 212	VISUAL STATION TABLE LOAD	4/01/74
RK 221	COMB R/R & HYPER PLOT NON-RT	3/26/86
RK 300	UTILITY COMPUTATIONS	10/21/80
RK 330	REFORMAT AND DATA CHECK	5/04/76
PM 360	ELECTRONIC CORRECTOR ABSTRACT	2/02/76
RK 407	GEODETIC INVERSE/DIRECT COMPUTATUION	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
AM 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 AM 902	5/07/76
RK 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 TEST	3/15/82
RK 950	HARDWARE TEST (DOCUMENTATION ONLY)	6/02/75

The program RK 221 was received onboard the RAINIER after data acquisition and processing of this sheet had begun.

While RK 112 corrector tapes are compatible with RK 221, a problem was found with the new program. Whenever a change in control occurs on the corrector tape, the last fix before the control change is not plotted correctly. Where this occurred on the final field sheet, soundings were inked in. The corrector tapes which accompany these data have been formatted to RK 221 standards.

The program RK 221 has an option to allow soundings to be plotted by time. This option was used where soundings overlapped due to junctions.

Some portions of the data were rejected by editing master tapes, while other data were rejected using the "block-rejections" format on the corrector tape. All NSP data have been blocked with the appropriate corrector tape code in the RK 221 format.

All data acquired using the latest version of RK 112 yielded master tapes with a "5" on the transducer-type/units indicator of the day word. This code implies that soundings were digitized using the "Fathoms, Wide Beam" setting on the DSF/6000N echo sounder. In fact, RAINIER was able to produce the proper "1" indicator (Fathoms, Narrow Beam) on all hydroplot systems by using an earlier version of RK 112. We therefore suspect that the problem lies somewhere in the new version of RK 221 (3/26/86).

After the final field sheet was plotted, it was discovered that the program RK 221 did not apply slope corrections to raw Mini Ranger rates. This resulted in some soundings being misplotted by over 60 meters. The misplotted soundings are most notable in the area of Round Island where ROUND was used as a signal. The Nautical Chart Branch, PMC, was informed of this problem, and directed RAINIER to forward the final field sheet with the misplotted soundings.

Duplicate fixes #3000 through #3149 were recorded by RAINIER (VESNO 2120) and launch RA-3 (VESNO 2123) during the survey.

S. REFERRAL TO REPORTS

The following reports contain information relevant to this survey:

Corrections to Echo Soundings Report, OPR-R184-RA-86
Horizontal Control Report, OPR-R184-RA-86
Electronic Control Report, OPR-R184-RA-86
Coast Pilot Report, OPR-R184-RA-86
Current Report, OPR-R184-RA-86
Water Clarity Report, OPR-R184-RA-86

Respectfully submitted,

George E. White
George E. White, LT, NOAA

II. FIELD TIDE NOTE

FIELD TIDE NOTE

RA 20-2-86

H-10219

Field tide reduction of soundings was accomplished by applying range ratio and time correctors derived by RAINIER to predicted tides from Black Rock, Alaska. Black Rock predicted tides were supplied by N/OMA123 Tidal Datum Quality Assurance Section. Predicted tide corrections were derived using program AM500. All times of both predicted and recorded tides are Coordinated Universal Time (UTC).

Bristol Bubbler tide gages were installed at five locations in the project area. Data from these stations were used for zoning recommendations. Tide station information follows:

BLACK ROCK (946-5182)

Geographic Locale	- Black Rock, Walrus Islands, Bristol Bay, Alaska. 58-42.5 N, 160-11.3 W.
Installation Date	- June 6, 1986
Removal Date	- September 9, 1986
Gage Type	- Two 0-30 scale Bristol Bubbler, primary S/N 64A 11028 and backup S/N 67A 16208.
Levels	- Installation levels, 6/6/86, and final levels, 9/9/86 were in excellent agreement with previous levels (difference $\leq 0.002\text{m}$).
Bench Marks	- Five recovered in good condition (BM No. 1 1948, No. 2 1948, No. 3 1948, BMs 5182 A 1985, 5182 B 1985).
Staff-Gage	- Primary = 0.73 ft - Backup = 0.19 ft.
Marigram Records	- Continuous records were obtained from both gages with the following exceptions: Primary - Between July 20(DN 201) and July 23(DN 204) the gage was overdampened. During this time the backup gage was also overdampened and no usable data were acquired. This break amounted to less than three days. It should be noted that the Summit Island and Kulukak gages were operational during this period. Backup - Between July 20(DN 201) and July 30(DN 211) was overdampened. Hourly heights were scaled from the primary marigram.

KULUKAK POINT (946-5265)

Geographic Locale - Kulukak Point, AK. 58-50.4 N, 159-38.8W
Installation Date - June 8, 1986
Removal Date - September 7, 1986
Gage Type - Two Bristol Bubbler 0-30 ft scale,
primary S/N 68A14940, backup S/N
64A11030. The backup gage also has an
electronic digital logger gage for
field evaluation. The marigram for the
backup gage will be sent to the Pacific
Tide Party.
Levels - Installation levels, 6/8/86, and final
levels, 9/7/86, were in excellent
agreement with previous levels
(difference $\leq 0.002\text{m}$).
Bench Marks - Recovered 5 in good condition (BM's
5265 A 1985, 5265 B 1985, 5265 C 1985,
5265 D 1985, 5265 E 1985).
Staff-Gage - Primary 2.09 ft
Backup 2.48 ft
Marigram Records - Uninterrupted records were obtained from
the primary gage and hourly heights
were scaled from this marigram. The
backup gage lost nitrogen pressure
between July 9 (DN 190) and
July 13 (DN 194). The digital gage
recorded data from July 3 (DN 184)
through July 21 (DN 202).

NUSHAGAK PENINSULA (946-4961)

Geographic Locale - Southwest side Nushagak Peninsula, AK
58/31.6 N, 159/09.6 W
Installation Date - June 10, 1986
Removal Date - August 7, 1986
Gage Type - Two 0-30 ft Bristol Bubblers
Primary S/N 67A 16205
Backup S/N 68A 9333
Levels - Installation levels, 6/10/86, had
excellent closure (difference = 0.002m).
Levels run on 6/19/86 and 8/7/86
verified no staff movement. Final
levels, 9/7/86, had a closure of
0.004m.

Bench Marks - One mark, 4961 B 1985, was recovered in good condition. BM's 4961 A 1985, 4961 C 1985, 4961 D 1985, 4961 E 1985 were destroyed. Six marks were set (4961 G 1986, 4961 H 1986, 4961 J 1986, 4961 K 1986, 4961 L 1986, TBM 1). BM's K, L, and TBM 1 are prefabricated 4 ft pipe marks. BM's G, H, and J are rod marks driven to refusal. All marks are protected with PVC pipe.

Staff-Gage - Primary = 3.91 ft
- Backup = 3.66 ft

Marigram Records - Uninterrupted records were obtained from the primary gage which was used for hourly heights. The backup gage chart drive would not work consistently.

NE SIDE SUMMIT ISLAND (946-4961)

Geographic Locale - Northeast side Summit Island, AK
58/50.8 N, 160/12.6 W

Installation Date - July 18, 1986

Removal Date - September 6, 1986

Gage Type - Bristol Bubbler 0-30 ft
Primary S/N 73A 235

Levels - Installation levels, 7/19/86, had excellent closure (difference = 0.001m). Final levels, 9/6/86, were in excellent agreement with previous levels (difference $\leq 0.002m$).

Bench Marks - Five marks were set (5283 A 1986, 5283 B 1986, 5283 C 1986, 5283 D 1986, 5283 E 1986). BM's were standard NOS bronze disk set in bedrock.

Staff-Gage - Primary = 2.02 ft

Marigram Records - Uninterrupted records were obtained. Upon changing marigram paper types from Charts-Inc(brown) paper to Bristol Company(red) paper, the staff to gage ratio changed from 2.02 to 1.55 ft.

ROUND ISLAND

Note: This gage was not required for this survey. The data were used to determine zoning.

Geographic Locale - Northeast side Round Island, AK
58/36.7 N, 159/58.0 W

Installation Date - July 9, 1986

Removal Date - July 16, 1986

Gage Type	- Bristol Bubbler 0-30 ft Primary S/N 73A 235
Levels	- No marks were set or leveled. The station was established only for zoning purposes. Levels were run to the waters edge from a rock TBM 1.
Bench Marks	- No marks were set.
Water-Gage	- Primary = 5.65 ft
Marigram Records	- Uninterrupted records were obtained.

UNALASKA CONTROL STATION

The control station at Unalaska was leveled July 26, 1986 by the Pacific Tide Party. RAINIER personnel also leveled the station. No problems were encountered with this station.

ZONING RECOMMENDATIONS

In accordance with section 5.9 of the project instructions for OPR-R184 the attached field tidal zoning is submitted for review.

Comparison of mainscheme data with soundings observed on crosslines and mainscheme splits indicated these data did not agree within expected tolerances. The apparent error was about one-half fathom, depending on the stage of tide. It was also noted that the tide data observed at two supplemental locations did not agree with the tidal zoning scheme provided in the project instructions.

One tide cycle was measured with the ship's echo sounder while anchored at 58/25.5N, 160/08.3W in Sheet X. This data conflicts with the preliminary zoning in that it indicates that the time correction with Black Rock is small and the range ratio is smaller offshore. In addition, a reconnaissance tide station was established on Round Island. This data confirmed that the co-tidal lines move from east to west and that the range of tide is less at Round Island than at Black Rock.

Therefore the RAINIER has developed a field tidal zoning scheme that resolves these discrepancies. The new scheme is based on the following information:

<u>Tide Station</u>	<u>HWI</u>	<u>LWI</u>	<u>Mn</u>	<u>Remarks</u>
Pt. Moller	7.24 hr.	1.01 hr.	7.38 ft.	Semi-diurnal
Nushagak	11.30	5.08	8.32	Semi-diurnal
Kulukak	11.68	5.51	8.22	Semi-diurnal
Black Rock	11.92	5.77	7.04	Semi-diurnal
Hagemeister	12.28	6.78	6.55	Diurnal
Round Island	11.8	5.7	6.7	7 day comparison with Black Rock
Summit Island	12.1	6.0	7.3	7 day comparison with Black Rock

The data from the first five tide stations were obtained from N/OMA via the telephone. They are based on historic data. The Round Island tide station was established on July 9, for seven days with permission from the state observer for the Alaska Department of Fish and Game. However, we were not allowed to set bench marks or install a tide staff, since the noise could disturb the walrus. The reconnaissance data from Round Island will be submitted directly to N/OMA12.

The Summit Island Tide Station was established on July 18, according to the project instructions and will collect a full month of data.

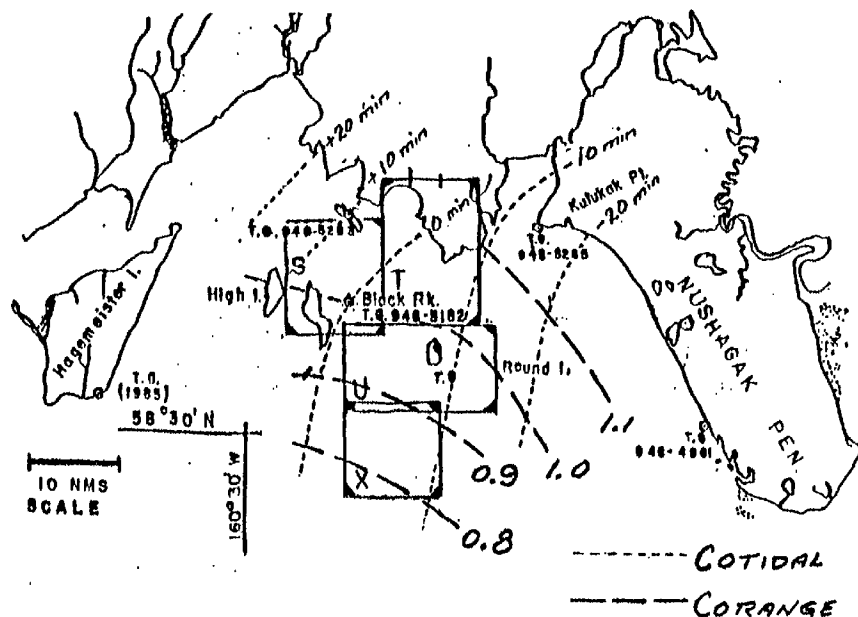
The RAINIER recommends that the attached field tidal zoning be used in place of the Preliminary Tidal Zoning specified in the project instructions.

FIELD TIDAL ZONING

BRISTOL AND TOGIAK BAY, ALASKA

OPR-R184-RA-86

CO-TIDAL CHART



CORRECTORS

HYDROGRAPHIC SHEET	TIME CORRECTION		HEIGHT RATIO
	HIGH WATER	LOW WATER	
X - North of 58/25.5N	- 05 min	- 05 min	x0.88
South of 58/25.5N	- 05 min	- 05 min	x0.82
U - North of 58/38.0N	- 07 min	- 07 min	x0.98
South of 58/38.0N	- 07 min	- 07 min	x0.93
T - East of 159/58.0W	- 08 min	- 08 min	x1.05
West of 159/58.0W	Direct on time		x1.05
S - East of 160/14.0W	Direct on time		x1.00
West of 160/14.0W	+ 07 min	+ 07 min	x1.00

by: A. Nicholas Bodnar
August 10, 1986

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: January 2, 1987

Marine Center: Pacific

OPR: R184

Hydrographic Sheet: H-10219

Locality: Round Island and vicinity, Bristol Bay, AK

Time Period: June 24 - August 6, 1986

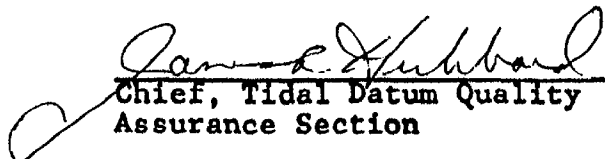
Tide Station Used: 946-5182 Black Rock, AK

Plane of Reference (Mean Lower Low Water): 8.91 Ft.

Height of Mean High Water Above Plane of Reference: 9.0 Ft

Remarks: Recommended Zoning:

1. East of longitude $160^{\circ}00.0'$ apply a -10 minute time correction and a x1.01 Range Ratio to all heights.
2. West of longitude $160^{\circ}00.0'$ Zone Direct.


Chief, Tidal Datum Quality
Assurance Section

ORIGINAL

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 7, 1991

MARINE CENTER: Pacific

OPR: R-184

HYDROGRAPHIC SHEET: H-10219 (REVISED)

LOCALITY: Round Island and Vicinity, Bristol Bay, Alaska

TIME PERIOD: June 24 to August 6, 1986

TIDE STATIONS USED: 946-5182 Black Rock, Alaska
Lat. 58° 42.5'N Lon. 160° 11.3'W


PLANE OF REFERENCE (MEAN LOWER LOW WATER): 8.91 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 9.0 ft.

REMARKS: RECOMMENDED ZONING

1. East of longitude of 160° 00.0'N, apply a -10 min. time correction and a x0.81 range ratio to Black Rock (946-5182).
2. West of longitude of 160° 00.0'N, times are direct and apply a x0.81 range ratio to Black Rock (946-5182).

Note: Times are tabulated in Greenwich Mean Time.


CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

VI. LIST OF STATIONS

MASTER STATION LIST
OPR-R184-RA-86. TOGIAK BAY. ALASKA

VERSION 9/23/86

104 3 58 36 19285 159 58 33257 250 0430 000000
ROUND 1948 STA. 1010

105 3 58 39 35271 160 15 14548 250 0125 000000
BOOB00 1985 RAINIER G.P.

106 3 58 46 12764 159 54 28445 250 0075 000000
RIGHT HAND 1948 STA. 1008

107 3 58 42 29904 160 11 23710 250 0039 000000
FOG RAINIER G.P.

110 3 58 42 26588 160 11 20914 243 0000 000000
CAL POLE RAINIER G.P.

200 3 58 42 10704 160 17 18642 139 0307 000000
CROOKED 1948 STA. 1002

202 3 58 38 21908 160 16 08412 250 0072 000000
CROOKED 1948 AZ MK STA. 1003

XII. DANGERS TO NAVIGATION



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ship RAINIER S-221
1801 Fairview Ave East
Seattle Wa. 98102

August 5, 1986

TO: N/CG222 - Norman E. Banks

THRU: N/MOP - Robert L. Sandquist

FROM: *Carl W. Fisher*
S221 - Carl W. Fisher
Commanding Officer, NOAA Ship RAINIER

SUBJECT: Danger to Navigation, Bristol Bay, OPR-R184-RA-86

While conducting hydrographic survey operations on OPR-R184-RA-86 in the vicinity of Round Island, Bristol Bay Alaska, the NOAA Ship RAINIER has discovered an uncharted rock which should be considered a danger to navigation. The rock was discovered while investigating AWOIS Item 50909, Sheet U, H-10219. The rock exposes 6.0 ft at MLLW and is located 0.2 nautical miles on a bearing of 333° T from the north west tip of Round Island. The rock covers at mid and higher tides. The geographic position determined by Mini-Ranger range-range fix is

58/37/13.51 N
159/59/45.39 W

This position verifies the rock shown on shoreline manuscript TP-01191 but does not appear on provisional chart 16315. The rock is located on the charted gravel spit whose existence and charted representation have been verified. Depths over the charted spit were found to be 0.1 fathoms to 0.6 fathoms at MLLW. Other charted rocks and shoal depths in the vicinity of the spit have not been found but have yet to be disproved. NOS charts affected by this danger are:

<u>Chart No.</u>	<u>Scale</u>	<u>Edition</u>
16315	1:100,000	2nd Ed, Jan 4/86
16011	1:1,023,188	31st Ed., June 29/86
16006	1:1,534,076	28th Ed., Mar 31/84

A radio-teletype message and a hard copy memo concerning this danger have been sent to the Coast Guard for publication in the Local Notice to Mariners. Copies are attached to this report.





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ship RAINIER S-221
1801 Fairview Ave East
Seattle, Wa 98102

August 5, 1986

Commanding Officer
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

RE: Notice to Mariners

REF: Radio Message 052120Z Aug 86

Dear Sir:

It is requested that the following be published in the
Local Notice to Mariners for the Seventeenth District:

"The NOAA Ship RAINIER of the National Ocean Service has
discovered an uncharted rock while conducting hydrographic
survey operations in the vicinity of Round Island, Bristol
Bay, Ak. The rock exposes 6.0 feet at MLLW and is located
0.20 nautical miles, 333°T from the northwest tip of Round
Island. The rock covers at mid and higher tides and is
located at the following geographic position:

58/37/13.5 N
159/59/45.4 W

The rock sets on a gravel spit which extends 1.35 nautical
miles on a bearing 330°T from the northwest end of Round
Island. Depths over the charted spit were found to be 0.1
to 0.6 fathoms at MLLW. NOS Charts affected by this danger
are:

<u>Chart No.</u>	<u>Scale</u>	<u>Edition</u>
16315	1:100,000	2nd Ed., Jan 4/86
16011	1:1,023,188	31st Ed., June 29/85
16006	1:1,534,076	28th Ed., Mar 31/84

Mariners transitting the area should exercise caution."

Sincerely,

Carl W. Fisher

Carl W. Fisher
Captain, NOAA

Commanding Officer, NOAA Ship RAINIER



10' 05' 160° 55'

UNITED STATES
ALASKA - WEST COAST

BRISTOL BAY

TOGIAK BAY AND WALRUS ISLANDS

Mercator Projection
Scale 1:100,000 at Lat. 58°40'

North American 1927 Datum

SOUNDINGS IN FATHOMS
(FATHOMS AND FEET TO ELEVEN FATHOMS)
AT MEAN LOWER LOW WATER

SURVEY WORK BY
NOAA SHIP RAINIER

JOINS CHART 5

45'

58°
40'

35'

Black Rock Is.

TERRITORIAL SEA (see note X)

ADD ROCK
EXPOSED 6 FEET AT MLLW

GRAVEL SPIT
SUBMERGED 0.1 FM AT MLLW

ROUND
ISLAND

Shoal (Rep 1981)

2nd Ed., Jan. 4/86

16315

LORAN-C OVERPRINTED

ADVANCE INFORMATION
SUBJECT TO OFFICE REVIEW

CO CWF

XU ANR

OP NEP

RTTUZYUW RUHPTEF0145 2172120-UUUU--RUHPSUU.

ZNR UUUUU

R 052120Z AUG 86

FM NOAA S RAINIER

TO CCGDSEVENTEEN JUNEAU AK

INFO NOAA MOP SEATTLE WA

DMATTC WASHINGTON DC//NVS//

ACCT CM-VCAA

BT

UNCLAS

IT IS REQUESTED THAT THE FOLLOWING BE PUBLISHED IN THE LOCAL NOTICE TO MARINERS FOR THE SEVENTEENTH DISTRICT:

THE NOAA SHIP RAINIER OF THE NATIONAL OCEAN SERVICE HAS DISCOVERED AN UNCHARTED ROCK WHILE CONDUCTING HYDROGRAPHIC SURVEY OPERATIONS IN THE VICINITY OF ROUND ISLAND, BRISTOL BAY, AK. THE ROCK EXPOSES 4.0 FEET AT MLLW AND IS LOCATED 0.20 NAUTICAL MILES, 333 T FROM THE NORTHWEST TIP OF ROUND ISLAND. THE ROCK COVERS AT MID AND HIGHER TIDES AND IS LOCATED AT THE FOLLOWING GEOGRAPHIC POSITION:

58-37-13.5N

159-59-45.4W

THE ROCK SETS ON A GRAVEL SPIT WHICH EXTENDS 1.35 NAUTICAL MILES ON A BEARING 330 T FROM THE NORTHWEST END OF ROUND ISLAND. DEPTHS OVER THE CHARTED SPIT WERE FOUND TO BE 0.1 TO 0.6 FATHOMS AT MLLW. NOS CHARTS AFFECTED BY THIS DANGER ARE:

16315 1:100,000 2ND ED., JAN 4/84

16011 1:1,023,188 31ST ED., JUNE 29/85

16006 1:1,534,076 28TH ED., MAR 31/84

MARINERS TRANSITTING THE AREA SHOULD EXERCISE CAUTION.

BT

#0145

NNNN

NOT / TO D
DM / 052320Z AUG 86
6 SCN / RATI



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ship RAINIER
1801 Fairview Ave East
Seattle Wa. 98102

September 24, 1986

TO: N/CG222 - Norman E. Banks

THRU: N/MOP - Robert L. Sandquist

FROM: S221 *Carl W. Fisher* Carl W. Fisher

SUBJECT: Dangers to Navigation, Bristol Bay, OPR-R184-RA-86

While conducting hydrographic survey operations on OPR-R184-RA-86, in the vicinity of the Walrus Islands, Bristol Bay, the NOAA Ship RAINIER has discovered three uncharted features which should be considered dangers to navigation.

FEATURE: 1.0 fathom shoal

General Locale: 0.18 miles west of south tip of Round Island, 0.1 miles offshore.

Geographic Position: 58° 35' 33.0" N
159° 58' 47.6" W

Registry Number: H-10219

Method of Investigation: A 1.0 fathom peak was discovered while running 100 meter splits of mainshcheme lines in the vicinity of the Round Island shoreline. The peak is on a slope with surrounding depths of about 3 fathoms.

FEATURE: Foul Area - 1.4 fm least depth

General Locale: Shoreline area south and east of Right Hand Point

Geographic Position (1.4 fathom least depth):
58° 45' 45.02" N
159° 54' 00.72" W

Registry Number: H-10220

Method Of Investigation: An area south and east of Right Hand Point was developed by an echo sounder investigation with line spacing of 25 meters. Numerous peaks were found in an area extending about .8 miles south of Right Hand Point. The foul area trends northeastward along shore, extending about .8 miles offshore, to an unnamed bay 2 miles northeast of Right Hand Point. Within this foul area, many 2 to 3 fathom peaks were found in 5 to 6 fathoms of water. The most significant peak discovered was a 1.4 fathom sounding .38 miles south of the southeast tip of Right Hand Point. This should be shown on chart 16315 as a 1 fm 2 ft depth.



FEATURE: Rock awash bares 1.5 ft at MLLW
General Locale: 2.5 miles NW of Right Hand Point, 350
meters offshore
Geographic Position: 58° 48' 12.26" N
159° 57' 11.22" W
Registry Number: H-10220

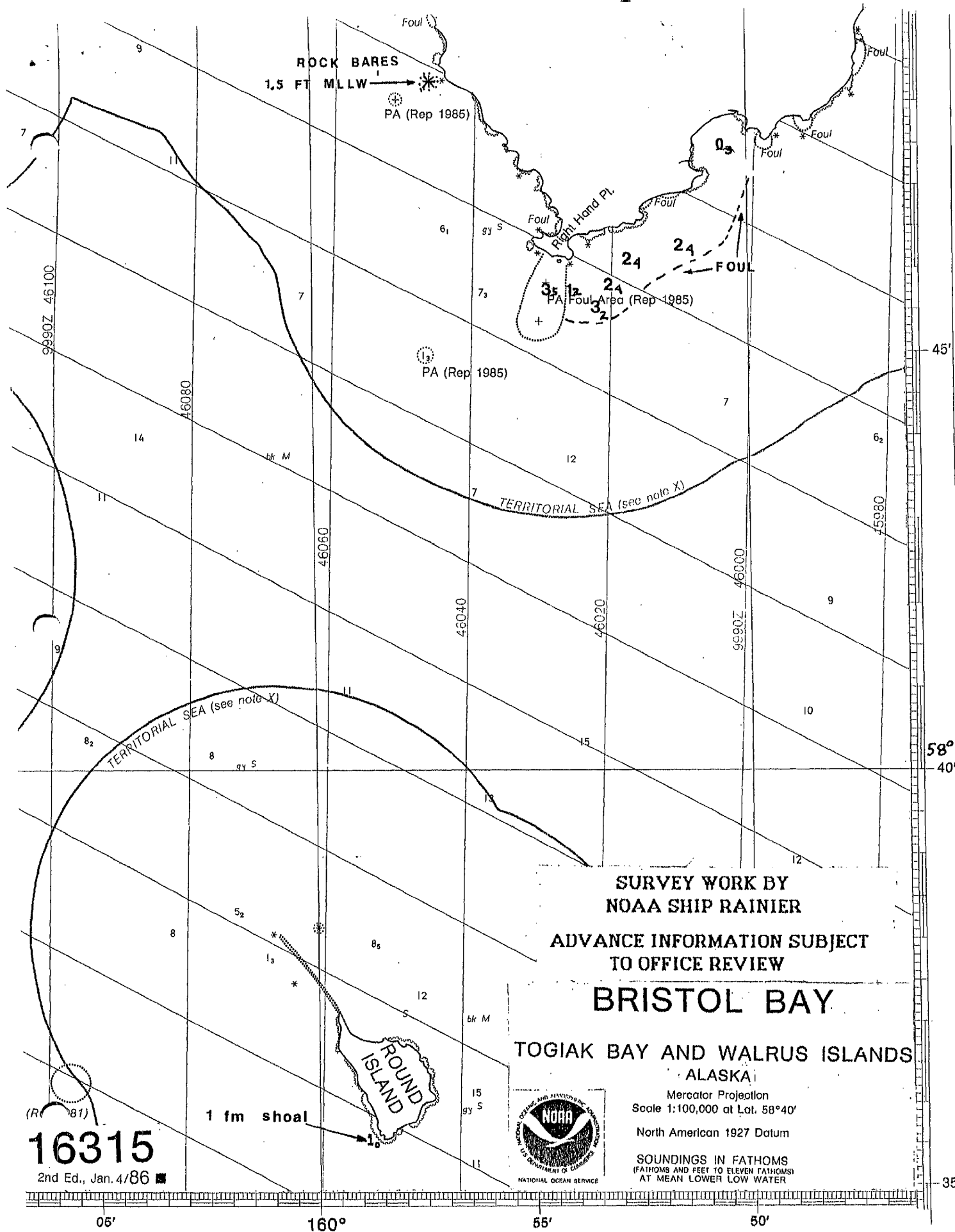
A dangerous rock awash was discovered at the above position. The rock bares 1.5 ft at MLLW and covers at most stages of tide. A submerged rock (PA Rep 1985) is charted .4 miles WSW of this position and was assigned as AWOIS Item 50921. An area within .5 miles of the rock's charted position was covered with an echo sounder search of 50 meter line spacing. No trace of another rock was found. It is recommended that a dangerous rock awash symbol supersede the currently charted PA submerged rock.

All investigations were performed with RAINIER launches. Electronic ranges were measured with the Mini-Ranger positioning system. Soundings were recorded with the DSF-6000N echo sounders. Survey data are in the process of being forwarded to Nautical Chart Branch, PMC, for verification. Charts affected by these dangers are:

<u>Chart No.</u>	<u>Scale</u>	<u>Edition</u>
16315	1:100,000	2nd Ed., Jan 4/86
16011	1:1,023,188	31st Ed., June 29/86
16006	1:1,534,076	28th Ed., Mar 31/84

A Local Notice to Mariners concerning these items has been issued and is appended to this report.

Attachments



SURVEY WORK BY
NOAA SHIP RAINIER
ADVANCE INFORMATION SUBJECT
TO OFFICE REVIEW

BRISTOL BAY

TOGIAC BAY AND WALRUS ISLANDS
ALASKA



Mercator Projection
Scale 1:100,000 at Lat. 58°40'
North American 1927 Datum

SOUNDINGS IN FATHOMS
(FATHOMS AND FEET TO ELEVEN FATHOMS)
AT MEAN LOWER LOW WATER

16315
2nd Ed., Jan. 4/86



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

NOAA Ship RAINIER
1801 Fairview Ave E.
Seattle Wa. 98102

September 24, 1986

Commanding Officer
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99802

RE: Notice to Mariners

Dear Sir:

It is requested that the following be published in the Local Notice to Mariners for the Seventeenth District:

"The NOAA Ship RAINIER of the National Ocean Service has discovered the following dangers to navigation during hydrographic survey operations in the vicinity of the Walrus Islands, Bristol Bay:

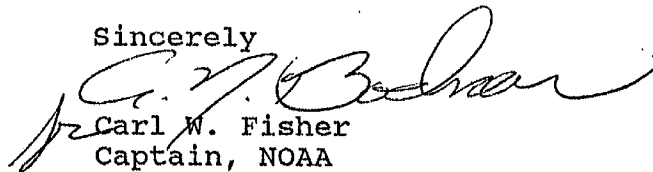
1. A 1.0 fathom shoal, 0.1 miles offshore and 0.18 miles west of the south tip of Round Island was found in 3-4 fathoms of water. The geographic position of the danger is $58^{\circ} 35' 33.0''$ N, $159^{\circ} 58' 47.6''$ W. Mariners are advised to give Round Island adequate clearance when transitting the area.
2. A foul area with submerged pinnacles has been discovered in the vicinity of Right Hand Point. Peaks as shoal as 1.4 (1 fm 2 feet on chart 16315) have been discovered in general depths of 5 fathoms. The geographic position of the 1.4 fathom peak is $58^{\circ} 45' 45.02''$ N, $159^{\circ} 54' 00.72''$ W. The foul area extends 0.8 miles south of Right Hand Point, and trends northeastward to include an unnamed bay 2 miles away. Along this stretch of shoreline, numerous peaks with depths less than 3 fathoms exist within 0.8 miles of shore. The small bay 2 miles northeast of Right Hand Point is foul with rocks and most depths are shoaler than 1 fathom.



3. A dangerous rock awash has been discovered along the shoreline about 2.5 miles NW of Right Hand Point. The rock is about 400 yards offshore and is located at position 58° 48'12.26 N, 159° 57'11.22" W. The rock exposes 1.5 feet at MLLW but is submerged at most stages of tide."

The large scale chart affected by these changes is chart 16315, 1:100,000, 2nd Ed., Jan 4/86.

Sincerely



Carl W. Fisher
Captain, NOAA
Commanding Officer

Enclosure

XIV. APPROVAL SHEET

APPROVAL SHEET

DESCRIPTIVE REPORT TO ACCOMPANY

HYDROGRAPHIC SURVEY

RA-20-2-86 (H-10219)

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

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

Carl W. Fisher

Carl W. Fisher
Captain, NOAA
Commanding Officer

III. GEOGRAPHIC NAMES LIST

GEOGRAPHIC NAMES

H-10219

Name on Survey	A	B	C	D	E	F	G	H	K
	ON CHART NO.	ON PREVIOUS SURVEY	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND MCNALLY ATLAS	U.S. LIGHT LIST	MANUSCRIPT
ALASKA (TITLE)									1
BRISTOL BAY	X							TP-01191 X	2
ROUND ISLAND	X							TP-01191 X	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25

Approved:

Charles E. Harrington
Chief Geographer - N/C6225

JAN 15 1987



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

OCT 21 1986

N/MOP21x2/JDW

TO: Commanding Officer
NOAA Ship RAINIER

Robert L. Sandquist

FROM: N/MOP - Robert L Sandquist

SUBJECT: Preprocessing Examination of H-10219, Alaska,
Bristol Bay, Round Island and Vicinity

Hydrographic survey H-10219 has been reviewed in accordance with Hydrographic Survey Guideline No. 15, and the Preprocessing Examination Critique for this survey is attached. Survey H-10219 is accepted for Pacific Marine Center processing.

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





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Pacific Marine Center
Nautical Chart Branch
7600 Sand Point Way NE
BIN C15700
Seattle, Washington 98115-0070

October 9, 1986

N/MOP21x2JDW

TO: N/MOP - Robert L. Sandquist

FROM: 
N/MOP 21 - Thomas W. Richards

SUBJECT: Preprocessing Examination for H-10219

I. SURVEY INFORMATION

A. Field No. RA-20-2-86 Registry No. H-10219

B. State: Alaska

General Locality: Bristol Bay
Sublocality: Round Island and Vicinity

C. Project Instructions: OPR-R184-RA-86

Original dated: April 16, 1986

Change No. 1 dated: May 23, 1986

D. Date:

Field Work Commenced: June 28, 1986

Field Work Completed: August 6, 1986

plus 6 weeks = September 18, 1986

Data received at Marine Center: September 25, 1986

plus 1 month = October 26, 1986

Examination critique transmitted to field: October 21, 1986

Target for completion of Marine Center processing: April 21, 1987



II. PREPROCESSING EXAMINATION CRITIQUE

Hydrographic survey H-10219 was performed by personnel of the NOAA Ship RAINIER, CAPT Carl W. Fisher, Commanding Officer. The following personnel supervised portions of the data acquisition: LT. White, LT (jg) Porta, LT (jg) LaReau, ENS Brown, ENS Damm, ENS Poston, and ENS O'Mara .

A. Danger to Navigation Report

There were four dangers to navigation reported by RAINIER for the area covered by H-10219.

No additional dangers were identified during the preprocessing examination.

B. Compliance with Instructions

This survey meets the requirements for a basic hydrographic survey.

After leaving the survey area the field unit discovered a 1.0 fathom peak which was not thoroughly investigated. RAINIER recommended additional field work to determine the least depth of the peak. Considering the proximity of a foul area to the 1.0 fathom peak, additional work on this feature may not be necessary.

C. Final Field Sheets

A number of rocks around Round Island were not identified by position number or reference number but the rocks were plotted on the final field sheet (attachment A). The Descriptive Report indicates shoreline verification on Round Island was extremely difficult due to the large population of Walrus which is protected by Alaska Fish and Wildlife Department Regulations. The survey records contain 21 reference-numbered observations which were apparently accomplished in the vicinity of Round Island, but only four of these observations were identified as features on the final field sheet. Each feature from the shoreline manuscript that is visually verified should be plotted on the final field sheet with associated reference number (PMC OPORTER Appendix P). It is not clear that all of the reference-numbered observations in the sounding volume represent shoreline manuscript features.

D. Descriptive Report

The Descriptive Report was extremely well-written. The appearance of the Descriptive Report is very professional. Section H should have included discussion on the reference-numbered observations which were not plotted on the final field sheet but were listed in a sounding volume. There is no recommendation from the hydrographer for processing these data.

E. Echograms

Annotation of echograms was excellent.

G. Sounding Correctors

The Corrections to Echo Sounding Report was not examined during this evaluation.

F. Raw Data Printouts and Sounding Volumes

The sounding volume used for shoreline feature verification has a section of pages which were stapled together. There are bottom sample and shoreline verification data within the stapled section. These data were apparently meant to be rejected. Entries rejected for any reason should be indicated by an "R" written boldly over the entry (HM 4.8.3).

The shoreline data in the sounding volume does not have any personnel or weather/sea conditions listed (HM 4.8.3.3, 4.8.3.7).

The shoreline data has reference numbers and positional data for shoreline observations (attachment B). Reference numbers should be used for shoreline manuscript features which are visually verified (PMC OORDER Appendix P). There is no indication of the field unit processing the positional data associated with these observations. The hydrographer's intention for these positional data is not clear. Additional information in the remarks column of the sounding volume should have been entered for thorough understanding and to ensure correct processing of the data (HM 4.8.3.10)

J. Positioning Control

The Electronic Control Report was not examined during this evaluation.

L. Automated Data Check

An excessive number of time-sequence errors on corrector tapes were revealed during spooling of the survey (attachment C). All corrector tapes should be checked with HYDROLOT program RK 330 for proper time sequence (PMC OORDER Appendix Q). It is recommended that persons responsible for checking corrector tape printouts list their initials on each printout when checking is done.

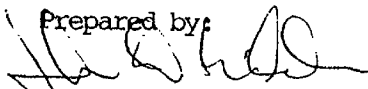
Not to be Smooth Plotted (NSP) data listed in the Abstract of Positions does not always match NSP data designated on the corrector tapes (attachment D). NSP data listed in the Abstract of Positions seems to better represent NSP designations in the Master Printouts; the Nautical Chart Branch will use the Abstract of Positions as the source of NSP data.

N. Survey Acceptance

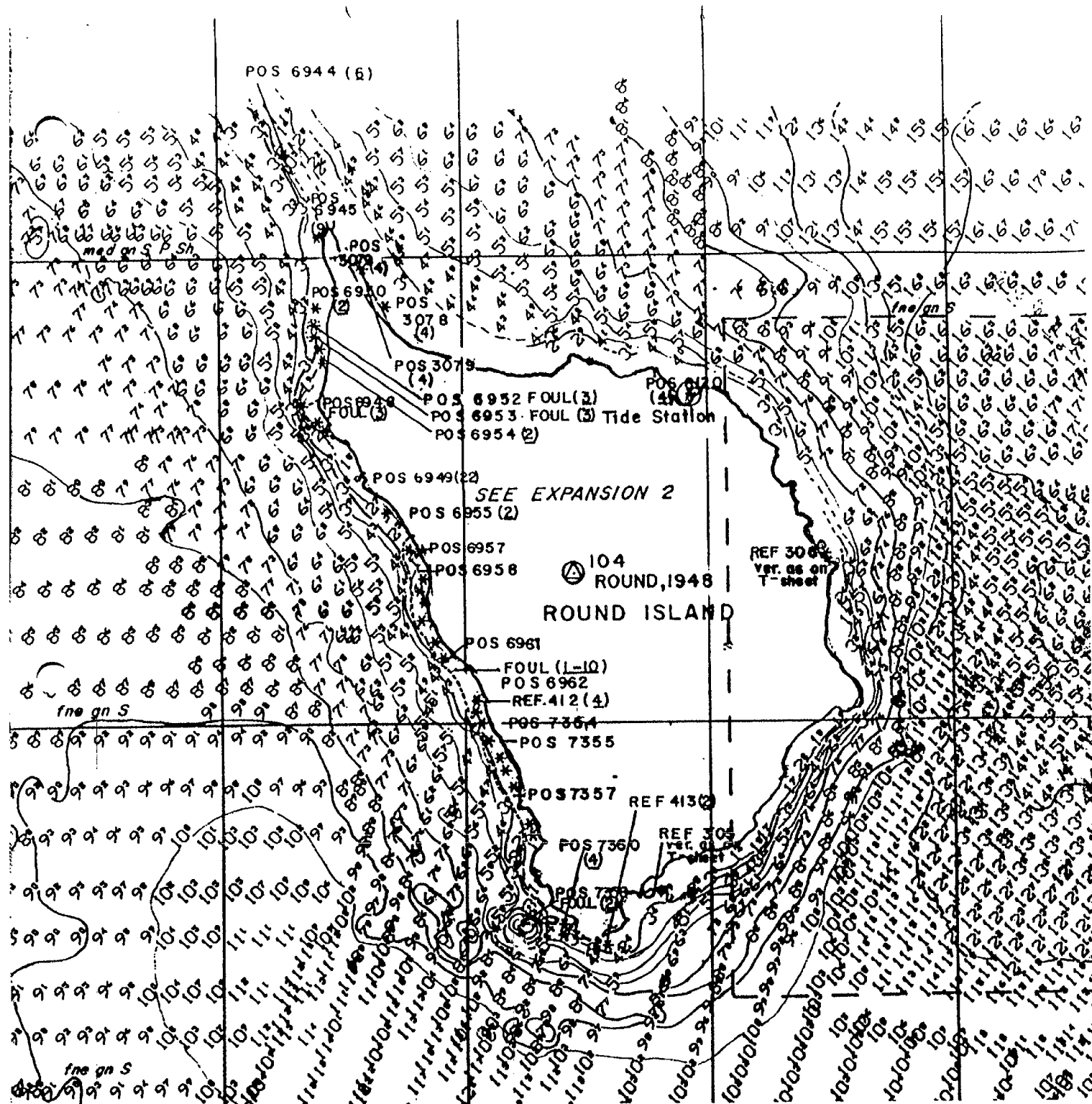
The preprocessing examination for H-10219 was conducted under the time constraints of HSG 15. All comments contained herein are based on a spot check of the data, and it is possible that some problem areas have not been addressed.

Except for the items noted in the critique, H-10219 is in compliance with the project instructions. I recommend that H-10219 be accepted for Nautical Chart Branch processing.

Prepared by:

A handwritten signature in dark ink, appearing to read 'J. D. Wilder', written over the printed name.

John D. Wilder



ATTACHMENT A

Rocks plotted on the final field sheet should be labeled with reference numbers for visual verification or position numbers when located. Several rocks on H-10219 have no such labeling.

Shown is a copy of the sounding volume used for shoreline verification. Reference-numbered features have positional data which was not processed. The hydrographer's intention for these data is not clear. At the beginning of each day's work the personnel, weather/sea conditions, and remarks necessary for efficient processing should be entered.

403	223850
404	225205
July 11, 1986 D.N. 192	
405	182552
406	183606

[illegible]

ATTACHMENT C

Shown below are some of the time sequence errors which were detected during spooling of the survey.

001 173646 5 0921 2126 193 100002 100002

002 173646 5 0921

003 173646 7 0005

004 173646 1 0065

005 173926 1 0046

006 174006 1 0023

007 175516 3 0101

008 175125 1 0016

009 175823 3 0118

010 175840 1 0124

011 180522 1 0164

012 181152 1 0152

013 181537 1 0161

014 181722 1 0164

015 182637 1 0142

016 182922 1 0134

017 183211 1 0136

018 183842 1 0158

019 184132 1 0165

020 184149 1 0165

021 184205 1 0165

022 184549 1 0156

023 184813 1 0151

024 185541 1 0166

025 185941 1 0144

026 190045 1 0138

027 191019 3 0104

028 193611 1 0148

029 193627 1 0147

030 195433 1 0160

031 195641 1 0154

032 195801 1 0150

033 195953 1 0146

034 200025 1 0144

035 200057 3 0144

036 201505 3 0092

037 213137 3 0003

038 213137 5 0921

039 213937 3 0074

040 214037 3 0082

041 214418 3 0073

042 214438 3 0072

043 214338 3 0079

044 214618 3 0057

045 215528 1 0084

046 215548 1 0084

047 215648 1 0075

048 220258 1 0073

049 220438 3 0082

050 220538 3 0086

051 220800 1 9999

138 002147 3 0083

139 002204 3 0082

140 002847 3 0083

141 002917 3 0084

142 002947 3 0078

143 003002 3 0074

144 003032 3 0070

145 002932 3 0080

146 003102 3 0063

147 003132 3 0065

148 003143 1 0060

149 003202 3 0076

150 003217 3 0088

151 003232 3 0093

152 003302 3 0102

153 003317 3 0105

048 000252 3 0003 2126 200 100002 100002

049 000252 4 5000

050 003047 4 6000

051 002328 1 0074

052 002600 1 0072

053 002718 1 0096

054 002733 1 0097

055 010135 1 0068

056 011127 1 0037

057 011500 1 9999

2126 193 100003 100002

045 221024 1 0093

046 221036 1 0093

047 222206 5 0921

048 221112 3 0095

049 222642 1 0092

050 222654 3 0090

051 222706 1 0090

ATTACHMENT D

NSP DATA

CORRECTOR TAPES
From Pos To Pos

1795 1885
2827 2840

VESNO 2120

VESNO 2126

6974 9002
9004 9130
9177 9189

VESNO 2124

7065 7224
7226 7288

ABSTRACT OF POSITIONS
From Pos To Pos

1795 1885
2827 2840

6896 6910
6922 6943
6974 9130

9177 9189

7060 7064
7065 7256 *
7269 7288

* Abstract of Positions shows positions 7257-7268 as rejected.

NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER H-10219	
HYDROGRAPHIC SURVEY STATISTICS					
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.					
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION	
SMOOTH SHEET		1412		SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS	
DESCRIPTIVE REPORT					
DESCRIP- TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR- GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS
ACCORDION FILES	3				
ENVELOPES					
VOLUMES	2				
CAHIERS					
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):		None			
PHOTOBATHYMETRIC MAPS (List):		None			
NOTES TO THE HYDROGRAPHER (List):		None			
SPECIAL REPORTS (List):		None			
NAUTICAL CHARTS (List):					
OFFICE PROCESSING ACTIVITIES <i>The following statistics will be submitted with the cartographer's report on the survey</i>					
PROCESSING ACTIVITY			AMOUNTS		
			VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET					4786
POSITIONS REVISED					6
SOUNDINGS REVISED					113
CONTROL STATIONS REVISED					0
			TIME-HOURS		
			VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION					
VERIFICATION OF CONTROL					
VERIFICATION OF POSITIONS			104.5		104.5
VERIFICATION OF SOUNDINGS			106.0		106.0
VERIFICATION OF JUNCTIONS					
APPLICATION OF PHOTOBATHYMETRY					
SHORELINE APPLICATION/VERIFICATION					
COMPILATION OF SMOOTH SHEET			90.0		90.0
COMPARISON WITH PRIOR SURVEYS AND CHARTS				21	21.0
EVALUATION OF SIDE SCAN SONAR RECORDS					
EVALUATION OF WIRE DRAGS AND SWEEPS					
EVALUATION REPORT				24	24
GEOGRAPHIC NAMES					
OTHER: Digitizing					
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	300.5	45
Pre-processing Examination by J. Wilder			Beginning Date 9/26/86		Ending Date 10/9/86
Verification of Field Data by T.O. Jones			Time (Hours) 300.5		Ending Date 6/22/87
Verification Check by J. Stringham, B.A. Olmstead, D. Hill			Time (Hours) 34.0		Ending Date 6/23/87
Evaluation and Analysis by G.E. Kay			Time (Hours) 45.0		Ending Date 8/21/87
Inspection by D.J. Hill			Time (Hours) 4		Ending Date 8/25/87

PACIFIC MARINE CENTER
EVALUATION REPORT
H-10219

1. INTRODUCTION

H-10219 is a basic hydrographic survey accomplished by the NOAA Ship RAINIER (S220) in accordance with project instructions for OPR-R184-RA-86, dated April 16, 1986, and Change Number 1, dated May 23, 1986.

H-10219 is the initial basic survey of the area in northern Bristol Bay, Alaska, centered near Round Island, one of the Walrus Islands. The area offshore is relatively flat with depths varying from 4 fathoms to 14 fathoms. The bottom rises quickly to a rugged shoreline as Round Island is approached. Fishing boats are the primary traffic in this area of Bristol Bay.

Predicted tides for Black Rock were used during field processing. Tide correctors used for the final reduction of soundings are based on approved hourly heights zoned from the gage at Black Rock (945-5182).

The field sheet parameters were revised to center the hydrography on the smooth sheet and to change the projection to polyconic. The TRA, sound velocity and electronic control correctors submitted with the survey records were used during office processing. The parameters and correctors used for the final reduction of the survey data are listed in the smooth position/sounding printout accompanying the survey records.

A digital file for this survey was generated that 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 included 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

Horizontal control and hydrographic positioning are adequately discussed in Sections F and G of the hydrographer's report and in the Horizontal and Electronic Control Reports for OPR-R184-RA-86.

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

Latitude: 2.781 seconds (86.1 meters).

Longitude: -7.878 seconds (-127.2 meters).

The year of establishment of 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 several positions in this survey that have lines of position that intersect at less than 30° or greater than 150°. These geometrically weak positions are 3748 to 3750, 6371 to 6396, 6400 to 6421 and 7232 to 7256. These positions were reviewed and are accepted for charting, as they are confirmed by adjacent data and were not used for the positioning of significant features.

The applicable shoreline manuscript is TP-01191. This registered Class III map originates from photography dated August 1983.

The misplotted soundings mentioned by the hydrographer in Section R were corrected during office processing.

3. HYDROGRAPHY

Except as noted subsequently in this section, hydrography within the limits of the sheet is adequate to:

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

Hydrography was not adequate to define the zero curve around Round Island. The Alaska Fish and Game Service requested that the field party not approach some parts of the shoreline, to not disturb the walruses.

4. CONDITION OF SURVEY

The hydrographic records and reports 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 Preprocessing Examination Report dated October 21, 1986 (copy appended) and as follows:

The least depth on a 1.2-fathom shoal indication at latitude 58°35'32.94"N, longitude 159°58'47.60W was not determined.

5. JUNCTIONS

H-10219 junctions with the following surveys:

Survey	Year	Scale	Area
H-10188	1985	1:20,000	south
H-10216	1986	1:20,000	south
H-10220	1986	1:20,000	north
H-10222	1986	1:20,000	northwest

The junctions with H-10216, H-10220 and H-10222 have been adequately effected.

A junction with H-10188 has not been formally completed. H-10188 was previously processed and submitted to headquarters for charting. The junction comparison was made using a copy. Soundings are in agreement. Depth curves on H-10188 should be adjusted to conform with those on this survey.

There are no contemporary surveys to the west; however, a comparison with charted depths reveals good agreement. This area will be surveyed later, as work on this project progresses.

6. COMPARISON WITH PRIOR SURVEYS

H-7718 (1948) 1:100,000

This prior survey covers the entire area of H-10219. The survey data compares well. See Section K, pages 20 to 21, of the hydrographer's report for specific information on the comparison.

AWOIS item 50909, originating from the prior survey and miscellaneous sources, is adequately discussed in Section K of the hydrographer's report.

H-10219 is adequate to supersede H-7718 within their common areas.

7. COMPARISON WITH CHART

Chart 16011, 30th Edition, dated April 1983; scale 1:1,023,188

Chart 16011, 31st Edition, dated June 1985; scale 1:1,023,188

Chart 16315, 1st Edition, dated March 1985; scale 1:100,000

Chart 16315, 3rd Edition, dated February 1987; scale 1:100,000

a. Hydrography - Most charted information originates from the prior survey discussed in Section 6 of this report. Some soundings and charted features originate from miscellaneous sources. See Section L of the hydrographer's report for additional comparison details.

AWOIS item 50885, originating from a miscellaneous source, is adequately discussed in section L of the hydrographer's report.

Chart 16315, 3rd Edition, dated February 1987, has been updated with data from the field sheets for this survey and from miscellaneous sources. Charted soundings are in agreement with this survey. Two rocks at latitude 59°38'03.0"N, longitude 160°01'00.0"W and latitude 59°38'08.0"N, longitude 160°00'00.0"W, originating from a miscellaneous source, were added to the 3rd Edition. These features, included as part of AWOIS Item 50909, were investigated during this survey. Section K, pages 15 to 21, of the hydrographer's report contains the results of the investigation and disposition of these features.

Geographic names appearing on the smooth sheet are approved by the Chief Geographer.

H-10219 is adequate to supersede charted hydrography within the common area.

The following Dangers to Navigation Reports (copies appended) were submitted to the Coast Guard and N/CG222:

Originator	Date	Coast Guard District
NOAA Ship RAINIER	August 5, 1986	Seventeenth
NOAA Ship RAINIER	September 24, 1986	Seventeenth

No additional dangers were identified during office processing.

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

c. Aids to Navigation - There are no fixed or floating aids within the limits of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

H-10219 adequately complies with the project instructions noted in Section 1 of this report.

9. ADDITIONAL FIELD WORK

This is an good basic survey. Additional field work is recommended to determine the least depth on the 1.2-fathom shoal indication at latitude 58°35'32.94"N, longitude 159°58'47.60"W.

Gordon E. Kay
Gordon E. Kay
Cartographer

"most likely a rock
pinnacle" (DR p.24)
AWOIS 50914

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
Dennis Hill
Chief, Hydrographic Section

ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10219

I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (C&GS) standards, complies with instructions, and is accurately and completely represented by the smooth sheet and digital data file for use in nautical charting.

Thomas W. Rielman 8/31/87
Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE:

Samuel Mordock 8/31/87

After review of the smooth sheet and accompanying reports, I hereby certify this survey is accurate, complete, and meets appropriate standards with only the exceptions as noted above. The above recommendations are forwarded with my concurrence.

for Sigmond R. Petersen 8/31/87
Director, Pacific Marine Center (Date)

ADDENDUM
H-10219

Survey H-10219 has been revised. This revision consists of a recomputation of depths and heights based on the establishment of a new tidal datum. The revisions are displayed on a film overlay which is intended to supplement hydrographic information previously displayed on the smooth sheet. The latest Tide Note, documenting the new tidal datum, has been attached to the descriptive report. The completed revision plot has been inspected with regard to delineation of depth curves, depiction of critical depths, junctions, cartographic symbolization, comparison with prior surveys and the verification or disproof of charted features. The digital data have been completed and all revisions and processing have been entered into the magnetic tape record for this survey. A final sounding listing has been made and is included with the survey records. The revised data and records comply with NOS requirements for use in nautical charting.

Dennis J. Hill Date 1-29-92
Dennis J. Hill
Chief, Hydrographic Processing Unit
Pacific Hydrographic Section

I have reviewed the smooth sheet revision overlay and accompanying data. This overlay and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting.

Douglas G. Hennick Date 1/29/92
Commander, Douglas G. Hennick, NOAA
Chief, Pacific Hydrographic Section

Final Approval

Approved:

J. Austin Yeager Date 10/27/94
J. Austin Yeager
Rear Admiral, NOAA
Director, Coast and Geodetic Survey

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10219

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.

[illegible]