

# 10222

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-20-4-86 .....

Registry No. .... H-10222 .....

### LOCALITY

State ..... Alaska .....

General Locality .. Bristol Bay .....

Sublocality ..... Summit Island to Crooked .....

..... Island & Vicinity .....

1986

CHIEF OF PARTY  
..... CAPT. C.W. Fisher .....

### LIBRARY & ARCHIVES

DATE ..... November 24, 1987 .....

10222

ACPG: Area 5

CHTS

16315

16011

16006

500-11

TO SIGN OFF SEE  
"RECORD OF APPLICATION"

## HYDROGRAPHIC TITLE SHEET

H-10222

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 20-4-86

State AlaskaGeneral locality Bristol BayLocality Summit Island to Crooked Island and VicinityScale 1:20,000 Date of survey August 6 - September 6, 1986Instructions dated April 16, 1986 Project No. OPR-R184-RA-86Vessel RAINIER S221 (2120), Launches 2123, 2124, 2125, 2126 & 2129Chief of party Capt. Carl W. FisherSurveyed by LT White, LTJG Porta, LTJG LaReau, ENS Brown, ENS Damm, ENS FellowsSoundings taken by echo sounder, hand lead, ~~port~~ DSF-6000-NGraphic record scaled by RAINIER PersonnelGraphic record checked by RAINIER PersonnelVerification by J. Shofner Automated plot by PMC Xynetics Plotter  
~~Protracted by~~Evaluation by A. Luceno  
~~Verification by~~Soundings in fathoms ~~feet~~ at MLW ~~MLLW~~REMARKS: Marginal notes in black by Evaluator. Separates are filed with  
the hydrographic data.✓ AWOIS and SURF RWD 2/88SC 2-5-97

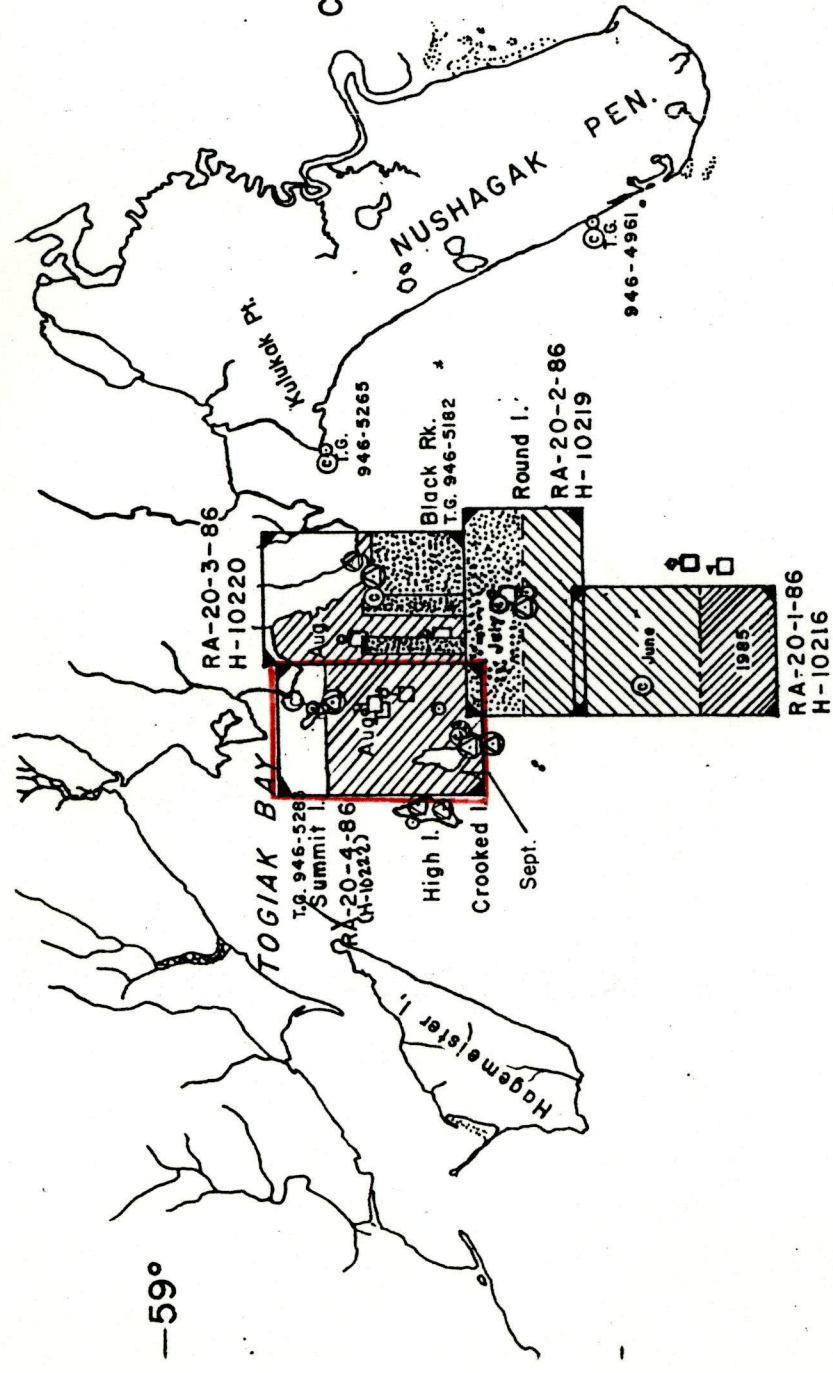
161° 160° 159°

Figure 1.

PROGRESS SKETCH

OPR-R184-RA-86  
 HYDROGRAPHIC SURVEY  
 TOGIAK BAY, ALASKA  
 JUNE 5 - SEPTEMBER 10  
 NOAA SHIP RAINIER  
 CARL W. FISHER, CAPT., NOAA  
 COMMANDING

FROM CHART 16011



JUNE	JULY	AUG.	SEPT.	
380.9	102.75	109	1.07	S.Q.N.M. Sounding
773.0	906	598	42.8	L.N.M. Misc Distance
1370.7	1328.8	1500	13.4	L.N.M. Sounding
99	206	98	0	Bottom Samples (Grab)
6	1	3	0	Control Stations (Electronic)
1	5	4	1	Temp. Depth, Sound Velocity
1	—	—	1	Nansen Cast
3	2	1	0	Tide Gauges
2	—	5	0	Stations Located by Traverse
7	—	4	1	Water Samples Analysed
—	0.7	—	0	S.Q.N.M. Side Scan Sonar
—	21.5	—	0	L.N.M. Side Scan Sonar
—	—	—	0	S.Q.N.M. Wire Drag
—	—	—	0	L.N.M. Wire Drag
16	12	1	0	Water Transparency Sta. (K-Meter)
4	3	1	0	Current Stations Occupied

159° 160° 161°

59° 58°

# Descriptive Report To Accompany Hydrographic Survey H-10222

Field Number RA-20-4-86

Scale 1:20,000

1986

NOAA Ship RAINIER

Chief of Party: Captain Carl W. Fisher

## A. Project

A basic hydrographic survey was completed as specified by Project Instructions OPR-R184-RA-86, dated 16 April 1986, ~~and~~ Change Number 1, dated 23 May 1986. The purpose of this project is to provide modern hydrographic survey coverage of Bristol Bay, Alaska for existing and new preliminary charts that are planned for the area. The survey is designated sheet S from the original sheet layout for the Bristol Bay survey project, dated 25 January 1985. The field number given this survey is RA-20-4-86 and the assigned registry number is H-10222. ✓

*\* and change Number 2, dated 8 August 1986.*

## B. Area Surveyed

The survey is located in northeast Bristol Bay, Alaska, in the vicinity of Crooked Island, Black Rock, and Summit Island (Figure 1). Crooked Island and Black Rock are part of the Walrus Islands group of uninhabited, and mostly tundra covered, islands and rocks. The southwest Alaska mainland lies two miles north of the northeast corner of the survey. The area is characterized by a generally flat, gently sloping bottom. The survey area is a frequently used shipping route for vessels transitting to the rich fishing grounds at Togiak Bay, Nunavachak Bay, and Kulukak Bay. The survey is bounded by the limits: ✓

North 58° 50' 00"N

South 58° 39' 30"N

East 160° 05' 40"W

West 160° 21' 20"W

Data acquisition was conducted from 6 August 1986 to 5<sup>th</sup> September 1986 (day 218 to day 248).

## C. Sounding Vessels

Data were acquired from the ship's four automated survey launches and a 17-foot aluminum hulled MonArk (Table 1).

Table 1. Sounding Vessels

<u>VESSEL</u>	<u>EDP NO.</u>	<u>OPERATION</u>
RA-3	2123	R/R, R/AZ
RA-4	2124	R/R
RA-5	2125	Bottom Samples
RA-6	2126	R/R
<del>RA-9 (MonArk)</del>	<del>2129</del>	<del>Shoreline Verification</del>

No changes to the standard sounding configurations were necessary. The MonArk was not outfitted for acquiring sounding data on this survey.

## D. Sounding Equipment and Corrections to Echo Soundings

### Sounding Equipment

All vessels used for this survey were equipped with either DSF-6000N or DE-719B Raytheon echo sounders (Table 2). All DSF-6000N echo sounders were operated in the HIGH + LOW (HIGH DIGITIZED) function, using manual gain controls to obtain the best analog trace. DSF-6000N soundings were recorded in fathoms and tenths of fathoms. Two-fathom bar checks were conducted once daily with both the narrow and wide beams in accordance with the Provisional Operating Instructions for DSF-6000N echo sounders.

Table 2. Raytheon Echo Sounders

<u>VESSEL</u>	<u>DSF-6000N SERIAL NUMBER</u>	<u>DAY NUMBERS</u>
2123	A123N	220-224
	A115N	225-248 <sup>g</sup>
2124	A103N	220-225
2125	A117N	232-234
2126	A119N	218-248

Transducers on the automated 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. ✓

All echo sounders functioned properly and remained in good working condition throughout the survey except for one problem with the DSF-6000N aboard RA-3. That unit was removed and replaced with another on day 224 because of a circuitry problem. The problem could not be solved satisfactorily in the field, and, although data quality was not severely impaired, the unit was returned to PMC for maintenance. ✓

Corrections to all soundings were determined for sea surface conditions, velocity of sound through water, settlement and squat, and tides. Variations in the instrument initial and stylus arm length are not present with the DSF-6000N. ✓

#### Other Sounding Equipment Used

A calibrated leadline was used to obtain ~~two~~ soundings from vessel 2124. The position numbers for the leadline depths ~~are 4234 and 4246~~, on day number 223. *Leadline not used for pos. 4234. Feature is a rock awash.* ✓

#### Sea Surface Conditions

The effects of sea surface conditions were corrected for by comparing each digitized sounding with those adjacent to it and with the analog trace. Fluctuations greater than 0.2 fathom resulting from sea action were removed, so the trend of the slope in this gently sloping area could be preserved in the digital record. However, even with this scanning technique, some effects of sea conditions still appear on the final field sheet as slight irregularities in depth contours where the bottom is known to be smooth with a minimum slope. ✓

#### 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 (S/N 3444) coupled to a Hewlett-Packard 5315A Universal Frequency Counter (S/N 1946A03637). The Plessy/Grundy Velocity Sensor was last calibrated in March, 1985 by The Northwest Regional Calibration Center, Bellevue, Washington (Appendix IV). ✓

Electronic sound velocity data were compared with velocities calculated from surface samples and from two Nansen casts to verify the validity of the electronic data (Table 3). Agreement between the two methods was typically within 1 meter/sec (Appendix IV).

Table 3. Velocity Casts

<u>CAST</u>	<u>DEEPEST DEPTH(m)</u>	<u>DAY NUMBER</u>	<u>POSITION</u>
N1	30	172	58°23.4'N, 159°53.9'W
1 #	30	172	58 24.0 , 159 52.8
5a*	25	211	58 43.8 , 159 59.8
5b*	10	211	58 50.2 , 160 01.9
6	25	219	58 44.1 , 159 56.2
7	10	220	58 49.6 , 160 01.6
8	25	225	58 45.0 , 160 12.9
9	25	232	58 46.6 , 160 12.9
10	25	251	58 45.9 , 160 09.1
N2	20	251	58 45.5 , 160 09.1

\* Casts 5a and 5b were made on the same day; one in shallow, one in deeper water.

N=Nansen Cast

# Cast numbers N1 and 1 provide a calibration check for the electronic sound velocity probe. Cast number 1 is not used for velocity corrector data in this survey.

Velocity correctors for this survey are applied on a leg by leg basis. At least one sound velocity cast was conducted per project leg, and all soundings collected each leg are referenced to the particular velocity correction table applicable to that leg only (Table 4). When more than one cast was made in a single leg the casts were averaged to produce a single velocity correction table for that leg. No velocity correctors are applied to bottom sample depths or detached positions in shoreline development.

Table 4. Velocity Correction Tables

<u>VELOCITY CORRECTOR TABLE NUMBER</u>	<u>VELOCITY CAST NUMBERS</u>	<u>APPLIES TO DATA ACQUIRED ON DAYS</u>	<u>APPLICABLE DEPTHS(FM) AND CORRECTORS(FM)</u>
0	none	all B.S's and D.P's	no correctors at any depth
6	5a,5b,6,7,8	211-223	0.0 - 3.2 / 0.0 3.3 - 9.6 <sup>2</sup> / +0.1 9.7 - 16.9 <sup>2</sup> / +0.2 17.0 <sup>3</sup> - 20.0 / +0.3
7	9	232-237	0.0 - 3.0 / 0.0 3.1 - 8.9 / +0.1 9.0 - 15.0 <sup>2</sup> / +0.2 15.1 <sup>3</sup> - 20.0 / +0.3
8	10	247-248	0.0 - 3.5 <sup>6</sup> / 0.0 3.6 <sup>7</sup> - 9.9 <sup>6</sup> / +0.1 10.0 <sup>2</sup> - 16.1 <sup>6</sup> / +0.2 16.2 <sup>7</sup> - 20.0 / +0.3

Velocity casts were performed in areas of the deepest depths, and also at other locations in the survey area. There was no indication of any change in sound velocity due to location. Therefore, the shallow casts were averaged in with the deeper casts to produce the velocity correctors for Table Number 6.

#### Settlement and Squat

Settlement and squat trials were performed on the survey launches (vessels 2123, 2124, 2125, and 2126) on 8 AUG 86 (day 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 dead in the water (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 is applicable to vessel 2124 for engine RPM greater than 2000. All other launches require no



settlement and squat correction at any speed (Appendix IV). The MonArk (2129) was not tested for settlement and squat because it was used only for reference system positioning.

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 Correctors

Tide correctors for this survey were provided by N/OMA12, based on 1985 data from Black Rock, Walrus Island, Bristol Bay, Alaska (946-5182). 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, and in order to formulate a more suitable corrector for the survey area, a supplementary gage was installed at Round Island for 7 days and one tide cycle was also measured using the ship's echo sounder while the ship was anchored. The method for obtaining the new zoning is discussed in detail in the Field Tide Note (Appendix II). Soundings on the final field sheet were plotted using the correctors calculated by RAINIER, applied to Black Rock predictions (Table 5). ✓

Table 5. Tide Correctors

APPLICABLE AREA	TIME CORRECTOR		HEIGHT RATIO
	High Water	Low Water	
E of 160°14.0'W	00 min	00 min	1.00
W of 160°14.0'W	+07 min	+07 min	1.00

Further details on all aspects of echo sounding corrections are provided in the supplemental Corrections to Echo Soundings Report, OPR-R184-RA-86.

#### **E. Hydrographic Sheets**

Survey data are plotted on two 1:20,000-scale plotter sheets designated RA-20-4E-86 and RA-20-4W-86. These sheets were prepared aboard the RAINIER, on a Houston Instrument Complot DP-3 roll plotter, using the PDP-8/e Hydroplot system and program RK 201, "Grid, Signal, Lattice Plot". This computer program draws a modified transverse mercator projection. ✓

The development, by 50 meter splits, of the area north of Black Rock is plotted on a 1:5,000 scale expansion sheet. The central meridian, false easting, and controlling latitude are constant on all field sheets.

The final field sheet and accompanying field records <sup>were.</sup> ~~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, with the exception of <sup>one</sup> ~~the~~ photogrammetrically located points (Table 6). All positions for control established prior to 1983 were provided by NGS, and the positions for the remaining stations are field unadjusted.

Table 6. Horizontal Control Stations

<u>SIGNAL NO.</u>	<u>STATION NAME</u>	<u>DATE ESTABLISHED</u>
104	ROUND 1948	1948
105	<del>BOOSEO</del> BOO BOO, 1985	1985
106	RIGHT HAND 1948	1948
108	SUMMIT 1948	1948
200	CROOKED 1948	1948
201	SUMMIT 1948 AZ MK	1948
202	CROOKED 1948 AZ MK	1948
204	CENTER	1986
205	LEFT	1986
208	RIGHT HAND 1948 AZ MK	1948
209	DUCE (Photo Pt)	1983
211	LOW	1986
212	DRO	1986

Station DUCE was photogrammetrically located in 1983, and the photo position was verified by resection before it was used. The photo position was used for electronic control as allowed in the project instructions.

The position for station <sup>BOO BOO</sup> ~~BOOSEO~~ (1985) was updated this year. It was discovered that last year's position for the station was slightly in error due to an erroneous EDM calculation. The station was re-occupied this year, and a new distance from station CROOKED 1948 was measured. This distance was used with the horizontal and vertical angles from last year to compute a new position for ~~BOOSEO~~.  
BOO BOO

There were no unusual survey methods used, and no anomalies were encountered. ✓

For more information on horizontal control for this survey, refer to Horizontal Control Report, 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. ✓

### Positioning Equipment

Four Mini-Ranger console/RT pairs were used during this survey (Table 7). Along with these console/RT pairs, seven shore transponders were used (Table 8). ✓

Table 7. Mini-Ranger Console / RT Pairs

<u>CONSOLE/RT PAIR</u>	<u>DN</u>	<u>EDP #</u>	<u>VESSEL NAME</u>
720/B1405	220-248	2123	RA-3
715/911615	219-225	2124	RA-4
711/C1712	232-236	2125	RA-5
B0269/B1388	218-248	2126	RA-6

Table 8. Shore Transponders

<u>Code</u>	<u>Serial Number</u>
0	O1789
1	C1883
2	B1106
3	911635
B	B1412
E	911721
F	911711

See Appendix V for the location of transponders and the days used.

The T-2 theodolite used to measure azimuths while running range-azimuth had serial number 75599. ✓

#### Calibrations and Systems Checks

An opening baseline calibration was conducted over a baseline on Lake Union in Seattle, Washington during May, 1986. Correctors and minimum signal strength values were determined for the following console/RT pairs: ✓

#### Console/RT pair serial numbers

715/911615  
720/B1405  
B0269/B1388

Console / RT pair 711/C1712 was baseline calibrated in Dutch Harbor, Alaska against transponder codes A, D, and 2. Correctors and minimum signal strength values were determined for these codes. During the survey, no soundings were positioned using the console 711. This console was used only to position bottom samples. (POS. 5318 to 5409) ✓

System checks were conducted throughout the survey in accordance with PMC OPORTER Appendicies M and S to confirm the established corrector values. Critical system checks were conducted weekly primarily using the theodolite intersection method. Noncritical system checks were conducted daily. The launch to launch method was the primary noncritical system check used. On several occasions, system checks were not obtained due to adverse weather. All observed system checks met the tolerances allowed for a 1:20,000 scale survey in compliance with PMC OPORTER Appendix M, table 1. An abstract of correctors derived from critical system checks can be found in Appendix V. ✓

A closing baseline calibration was conducted over the Lake Union baseline during the fourth week in September, 1986. Corrector and minimum signal strength values were determined and compared with the opening baseline calibration values. With one exception, (console 711 - code 2, the opening and closing correctors differed by seven meters) the closing correctors agreed to within five meters of opening correctors. Therefore, the opening baseline correctors were maintained as the final correctors. The final field sheet was plotted onboard the RAINIER with these baseline correctors applied. ✓

Further details on calibrations and system checks can be found in the Electronic Control Report, OPR-R184-RA-86.

*Requirement for bi-monthly Mini-Ranger baseline calib. waived by PMC Director on 23 March 1987.*

### Positioning Techniques

Range-range geometry was the principle method of locating soundings throughout this survey. Standard survey launches were used to acquire soundings. No unusual techniques were employed. ✓

Range-azimuth hydrography was used to fill a hole in the southwest corner of the survey area. The loss of line of sight to one station and poor intersection between the other stations resulted in this hole. The hydrography, 6.2 nautical miles, were acquired on DN 248, with vesno 2123 from station CROOKED AZ. ✓

Bottom samples were acquired with the console/RT pair 711/C1712 in vesno 2125. This console was not calibrated to the transponders B, E, F, 0, 1, and 3 as explained in the Electronic Control Report, OPR-R184-RA-86. No correctors were applied to the observed ranges in deriving positions. ✓

### Control Problems

Mini-Ranger range holes presented 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 with steady signals. Upon coming out of the range hole, 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. Range holes were filled in by rerunning that portion of the line with different control. ✓

\* Sect. 1.4.5

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 areas of low signal strengths occurred unpredictably throughout the survey area. ✓

(See Sect. 2 of Eval. Report.)

### Andist

The RT units on vessels 2123, 2124, 2125, and 2126 are located over the transducers with an ANDIST of 0,0. ✓

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

## H. Shoreline

### Shoreline Manuscripts

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

TP-01190 ALASKA TOGIAK BAY TO CAPE CONSTANTINE CROOKED ISLAND Scale 1:20,000 Transverse Mercator Projection	<i>TP-01186          ALASKA          TOGIAK BAY TO CONSTANTINE          SUMMIT ISLAND          Scale 1:20,000</i>
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Shoreline manuscript TP-01190 was compared to prior photogrammetric surveys T-9242 and T-9248 :

U.S. COAST AND GEODETIC  
 SURVEY  
 TOPOGRAPHIC MAP  
 T-9242  
 ALASKA  
 SUMMIT ISLAND  
 Scale 1:20,000

U.S. COAST AND GEODETIC  
 SURVEY  
 TOPOGRAPHIC MAP  
 T-9248  
 ALASKA  
 WALRUS ISLANDS  
 Scale 1:20,000

These polyconic projections compare well to the contemporary manuscript. However, the older manuscripts show more foul areas and ledges where the new manuscript shows numerous individual rocks. RAINIER believes the foul area depictions are better representations of the actual shoreline conditions, and recommendations are made below for specific changes to this effect.

Shoreline details have been verified by use of the following three methods:

- a. Detached positions
- b. Reference numbers (as directed in the PMC OORDER 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 are shown in black and changes are shown in red. Detached positions on the final field sheet are plotted with their four digit position numbers. Reference system numbers are plotted with their three digit numbers preceded by the letter 'R'.

No shoreline manuscript features are recommended for removal; however, two features were changed and several new features were added and documented in the field (Table 9). Some T-sheet features located within foul areas could not be approached, so detached positions are given for the closest inshore rocks which could be obtained. The T-sheet items not specifically given position numbers are addressed individually in the field record. In such cases when T-sheet items could not be documented because of other surrounding hazardous rocks, the hydrographer recommends that the areas concerned be designated as foul zones. Where T-sheet items are documented by detached positions, the hydrographic position verifies the manuscript position in every case.

CONCUR

CONCUR

Table 9. Changes and Additions to T-Sheet Manuscript

<u>CHANGES</u>		
<u>POSITION OR REFERENCE NO.</u>	<u>GEOGRAPHIC POSITION</u>	<u>FEATURE</u>
R900	58/43/44.8 N 160/18/08.0 W * (2)	rock bares 9.0 ft at MLLW (change islet to rock)
4238	58/40/38. <sup>19</sup> <sub>21</sub> N 160/15/09.6 <sup>5</sup> <sub>6</sub> W * (3)	rock bares <sup>3.0</sup> <del>2.8</del> ft at MLLW (move T-sheet rock offshore to this position)
<u>ADDITIONS</u>		
<u>POSITION NO. REFERENCE NO.</u>	<u>GEOGRAPHIC POSITION</u>	<u>FEATURE</u>
R608	58/43/20 N 160/16/55 W * (1)	rock bares <sup>7.8</sup> <del>6.8</del> ft at MLLW (This feature, shown as 4 rocks on T-sheet, should be enclosed in a new foul zone symbol)
4229	58/40/48. <sup>4</sup> <sub>86</sub> N 160/15/44. <sup>2</sup> <sub>29</sub> W * (2)	N limit of a foul zone begins here, with a rock baring 2.4 <sup>0</sup> ft at MLLW
4231	58/40/47.0 <sup>1</sup> <sub>3</sub> N 160/15/48.71 W * (3)	rock bares 3.4 <sup>0</sup> ft, within new foul area depiction
4232	58/40/51.5 <sup>1</sup> <sub>3</sub> N 160/15/26.47 W <sup>05</sup> AK	rock <sup>8.5</sup> <del>2.4</del> ft below MLLW, within new foul area

4234	58/40/49.7 <sup>7</sup> N 160/15/25.85 W	* (2)	rock bares 2.4 <sup>0</sup> ft, within new foul area
4235	58/40/46.1 <sup>6</sup> N 160/15/17.38 W	* (3)	rock bares 3.4 <sup>0</sup> ft, within new foul area
4239	58/40/36.6 <sup>3</sup> N 160/15/08.79 W	* (2)	rock bares 4.8 <sup>5.0</sup> ft, within new foul area
4241	58/40/31.2 <sup>19</sup> N 160/15/01.21 W	* (5)	S limit of new foul area includes this T-sheet rock
4243	58/40/19.5 <sup>48</sup> N 160/14/52.31 W	* (2)	N limit of new foul area includes this T-sheet rock
4244	58/40/12.5 <sup>1</sup> N 160/14/41.24 <sup>5</sup> W	* (1)	rock bares 1.8 <sup>0</sup> ft, within new foul area
4246	58/40/06.6 <sup>6</sup> N 160/14/34.57 W	* cov. 1 ft at MLLW	rock 0.6 <sup>1.0</sup> ft below MLLW, within new foul area
4248	58/39/56.5 <sup>7</sup> N 160/14/30.84 W	* (2)	rock bares 1.8 <sup>2.0</sup> ft, within new foul area
4251	58/39/40.5 <sup>5</sup> N 160/14/29.85 W	* (4)	rock bares 3.8 <sup>4.0</sup> ft, within new foul area
4252	58/39/39.4 <sup>7</sup> N 160/14/32.14 W	* (4)	rock bares 3.8 <sup>4.0</sup> ft, within new foul area
4269	58/42/24.9 <sup>88</sup> N 160/16/23.61 W	* (8)	rock bares 7.4 <sup>8.0</sup> ft at MLLW
4274	58/42/45.5 <sup>5</sup> N 160/16/27.99 W	* (5)	rock bares 4.6 <sup>5.0</sup> ft at MLLW and defines S limit of a new foul area
4275	58/42/47.1 <sup>09</sup> N 160/16/28.24 W	* (9)	rock bares 8.6 <sup>9.0</sup> ft at MLLW, within new foul area
4327	58/42/42.2 <sup>6</sup> N 160/11/22.41 W	* (3)	rock bares 2.6 <sup>3.0</sup> ft at MLLW
4329	58/42/40.8 <sup>0</sup> N 160/11/22.49 W	* (4)	rock bares 3.6 <sup>4.0</sup> ft at MLLW



4330	58/42/40.0 <sup>0</sup> N 160/11/22.60 W	* (1)	rock bares 6.6 <sup>0</sup> ft at MLLW
4332	58/42/34.8 <sup>6</sup> N 160/11/22.90 W	* (6)	rock bares 6.6 <sup>0</sup> ft at MLLW
4333	58/42/35.5 <sup>5</sup> N 160/11/17.81 W	* (1)	rock bares 1.0 ft at MLLW
4340	58/42/29.3 <sup>2</sup> N 160/11/19.7 <sup>6</sup> W	* (4)	rock bares 4.2 <sup>0</sup> ft at MLLW

Although all manuscript features are thoroughly addressed in the field records, some of the more important and major items deserve additional discussion here. Most of the following explanations are regarding items listed above (Table 7), but for a thorough understanding the reader should refer to the field sheets, printouts, and sounding volumes.

#### CROOKED ISLAND:

(R900) As this rock bares only 9 feet at MLLW, and is 15 feet wide, the hydrographer recommends the islet symbol be changed to a rock symbol. *concur ✓*

(4238) The T-sheet rock could not be approached because it lies within a foul area; but a larger rock, baring 2.8 feet at MLLW is located offshore of the manuscript rock position. The hydrographer recommends the position of the rock symbol be changed to represent this larger, more offshore rock. *concur ✓*

(R608) A single reference position represents four manuscript rocks, and several others, which should be shown as a foul area drawn around the four T-sheet rocks. *concur ✓*

(4229-4241) A foul area should be indicated as including these positions. Numerous additional rocks are also within this area, but could not be approached. It is recommended that all existing manuscript rocks be retained to help delineate the foul area. *✓  
concur*

(4240, 4241) Where the manuscript shows three rocks, only the northern and southernmost could be approached safely. The middle rock is present. *✓*

Pos. 4240 58/40/33.95 ; 160/15/03.76

(See page 13 for GRs of other listed positions)

(4242-4255) A foul zone should be added, surrounding these positions. It was impossible to safely define all rocks within this area. Individual rock symbols on the manuscript are not actually individual features, but clusters of rocks. Positions could be obtained on some, but not all, of the manuscript items. Keep manuscript rocks to help delineate the foul zone. concur ✓

(4242,4243) Where the manuscript shows three rocks, only the northern and southernmost could be approached safely. The middle rock is present. Position 4243 is the northernmost, 4242 is the southernmost. ✓

(4246) Two manuscript rocks shown inshore of position 4246 could not be distinguished from the rocky shoreline. ✓

(4247) A manuscript rock inshore of this position was not distinguishable from the rocky shoreline. Retain the T-sheet symbol inshore of this position as representation of the foul area. concur ✓

(4249) Five additional manuscript rocks inshore of this manuscript rock were unapproachable due to the extent of the foul area. Keep all rocks in this area as a representation of the foul area. concur ✓

(4251) The T-sheet rock inshore of this position could not be reached. Add this rock offshore of the existing rock symbol. concur ✓

(4255) The foul area continues south of this position on the east side of Crooked Island. However, this position marks the southern limit of the current survey. ✓

(4274,4275) Add a foul zone surrounding these positions and R613. The T-sheet rock inshore of position 4274 should be retained to help delineate the foul zone. concur ✓

#### BLACK ROCK:

(4332,4333) Add these two significant rocks surrounding the T-sheet rock, which was not safely approachable. concur ✓

(4325,26,28,35-39,41) These positions, designated NSP, represent visible portions of Black Rock and some clustered detached rocks which are too close to Black Rock to be adequately plotted at the scale of this survey. All are plotted on the 1:5,000 scale expansion sheet.

(4327,29-33,40) These positions define rocky and foul areas not shown on the current manuscript.

*See back page for GPs of position.*

Pos #	Lat. (N)	Long. (W)
4242	58/40/17.24	160/14/49.04
4255	58/39/32.25	160/14/42.29
4247	58/40/00.36	160/14/31.01
4249	58/39/52.05	160/14/26.42
4255	58/39/32.25	160/14/42.29
4325	58/42/41.94	160/11/23.64
4326	58/42/42.13	160/11/23.45
4328	58/42/41.16	160/11/22.16
4335	58/42/35.69	160/11/20.07
4336	58/42/33.21	160/11/23.40
4338	58/42/32.20	160/11/21.44
4339	58/42/31.19	160/11/20.02
4341	58/42/26.63	160/11/17.14

(4251) The T-sheet rock inshore of this position could not be reached. Add this rock offshore of the existing rock symbol.

(4252) The four area continues south of this position on the east side of Crooked Island. However, this position marks the southern limit of the current survey.

(4274, 4275) Add a four zone surrounding these positions and R613. The T-sheet rock inshore of position 4274 should be retained to help delineate the four zone.

**BLACK ROCK:**

(4332, 4333) Add these two significant rocks surrounding the T-sheet rock, which was not safely approachable.

(4325, 26, 28, 35-39, 41) These positions, designated MSP, represent visible portions of Black Rock and some clustered detached rocks which are too close to Black Rock to be adequately plotted at the scale of this survey. All are plotted on the 1:5,000 scale expansion sheet.

(4327, 29-33, 40) These positions define rocky and four areas not shown on the current manuscript.

### Further Shoreline Development

Splits of mainscheme sounding lines were conducted around Summit Island, Crooked Island, and Black Rock to ensure that no undiscovered shoals or obstructions were present. In fact, one new shoal was discovered in this manner, and is discussed in Section K.

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 errors in the depth determined when scanning records for sea action can cause horizontal displacement of depth curves. Also, small errors in predicted tide correctors cause minor irregularities in the contours where adjacent mainscheme lines are run at different stages of the tide.

No control stations are located seaward of the shoreline.

### **I. Crosslines**

A total of 58.3 nautical miles of crosslines were run, using the same vessels and sounding equipment used to run mainscheme. This is equivalent to 8 percent of the total mainscheme hydrography. A random sample of 108 crossline/mainscheme comparisons were made across the sheet, and in all cases, crossline soundings agreed with mainscheme soundings within 0.4 fathom (Table 10). The magnitude of the discrepancies is consistent over the entire sheet.

Table 10. Crossline Agreement

---

Soundings within 0.1 fathom :	68%
Soundings within 0.2 fathom :	85%
Soundings within 0.3 fathom :	94%
Soundings within 0.4 fathom :	100%

---

The largest disagreements which exist result from a combination of small errors in predicted tide correctors and the effect of moderate wave action, especially in areas of comparatively even bottom. Where the bottom is smooth, as in most of this survey area, slight discrepancies in digitized soundings can produce much larger lateral displacement of depth contours.

## J. Junctions

This survey junctions with two contemporary surveys (Table 11).

Table 11. Junction Surveys

<u>REGISTRY NO.</u>	<u>SCALE</u>	<u>YEAR</u>	<u>LOCATION</u>
H-10219	1:20,000	1986	southeast junction
H-10220	1:20,000	1986	east junction
H-10248	1:20,000	1987	North (processing ongoing)

The surveys H-10219 and H-10220 were conducted concurrently with this survey. Data acquisition was continuous throughout this group of field sheets. No irregularities or significant differences were found with soundings or depth contours at the junction points of these sheets, and no adjustments to soundings or contours are recommended (Table 12). Survey H-10219 was sent to the Marine Center before a quantitative junction comparison could be made, but cursory comparisons, made during data acquisition, showed satisfactory junctions. ✓

Table 12. Junction Agreements

<u>SURVEY</u>	<u>WITHIN .1 FM</u>	<u>WITHIN .2 FM</u>	<u>WITHIN .3 FM</u>
H-10220	57 %	85 %	98 %

Checks of launch to launch junctions were examined daily throughout the course of the survey, and proved to be in satisfactory agreement. ✓

## K. Comparison With Prior Surveys

### AWOIS Items

Two AWOIS items are located within the limits of this survey (Table 13). Item 50912 originates from survey H-7718 of 1948, and is a reported 1.2 fathom sounding west of Crooked Island at latitude  $58^{\circ}42'50''N$ , longitude  $160^{\circ}20'00''W$ . Item 51031, reported by RAINIER in 1985, is a 2.5 fathom sounding west of Crooked Island at latitude  $58^{\circ}44'N$ , longitude  $160^{\circ}19'W$ . Since both are in the same proximity they will be ✓

addressed together. Both items were verified by echo sounder investigation.

Table 13. AWOIS Items

AWOIS ITEM	#50912	#51031
ITEM ORIGIN	H-7718	RAINIER
CHARTED FEATURE	1.2 fm shoal	2.5 fm shoal
CHARTED POSITION	58/42/50 N 160/20/00 W	58/44/00 N 160/19/00 W
SURVEY POSITION	58/43/12.48 <sup>5</sup> N 160/19/40.29 <sup>5</sup> W	58/43/38.39 <sup>7</sup> N 160/18/45.04 <sup>9</sup> W
LEAST DEPTH	1.2 <sup>1</sup> fathoms (fix: 2018+4)	1.8 <sup>3</sup> fathoms (fix: insert <sup>5</sup> after 2000+4)
METHOD OF INVESTIGATION	echo sounder search	echo sounder search
RECOMMENDATION	show the shoal area on chart	

A 100 meter spaced echo sounding development was run over the entire area adjacent west of Crooked Island, as shown on the final field sheet. A large shoal which incorporates both items was found, with depths ranging from 1.2 to 2.5 fathoms. In addition to the two AWOIS items, a third site with a least depth of 1.5 fathoms was found nearby at latitude 58/43/41.28 N, longitude 160/20/24.30 W (Figure 2). Depth contours in the area of the shoals show a gradual rise to the least depths, with the sharpest rise indicated in the vicinity of the non-AWOIS shoal. All three least depths lie within a 0.5 mile radius, 0.7 mile west of the north tip of Crooked Island (Figure 2). RAINIER recommends representative shoal depths be charted on the basis of this investigation.

CONCUR

#### Comparison

This survey was compared directly with one prior survey: Registry No. H-7718 (1948), scale 1:100,000. The 1948 survey was a reconnaissance survey, conducted at a smaller scale and with less detail than survey H-10222. Soundings are sparse and depth curves are not adequately depicted. Also, the scale of the prior survey (1:100,000) does not allow for an accurate comparison of plotted soundings with this 1:20,000 scale survey. Survey H-10222 provides a greater

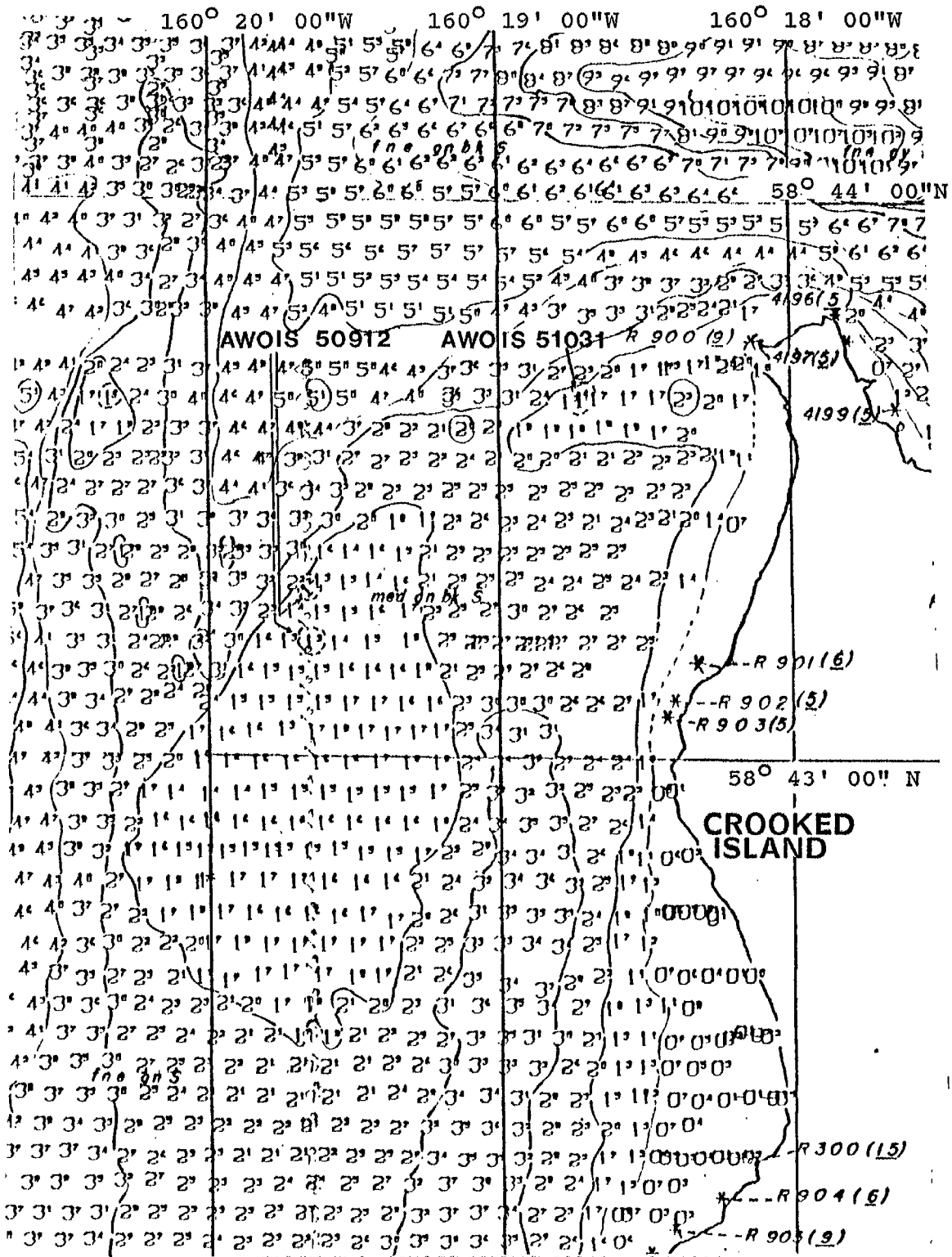


FIGURE 2. AWOIS ITEMS 50912 and 51031  
 Item 50912: Two least depths of 1<sup>2</sup> fm.  
 Item 51031: Least Depth = 1<sup>4</sup> fm.

concentration of soundings, supporting a more accurate depiction of the depth curves.

Depths from the current survey generally agree well with the prior survey. Differences ranging from 0 to 1.5 fathoms appear in the comparison, with the 1948 survey always showing shoaler depths than the 1986 survey. Speculation on the reason for the discrepancy is that the 1948 surveyors may not have had sufficient information to establish a tidal datum. ✓

No significant features, depths, or rocks shown on the prior survey have been disproved. ✓

## L. Comparison With The Chart

This survey was compared with three contemporary charts (Table 14). Within the area of this survey, all three charts contain soundings from the two prior surveys H-7718 (1948) and BP-18063 (1916).\* The comparison with H-7718 was already discussed in Section K, and those charted depths generally agree well with the current survey. However, the charted depths from the 1916 survey show differences with the current survey ranging from 5 to 7 fathoms; the prior survey consistently showing shoaler depths than the current survey (Table 15). The magnitude of the discrepancies is consistent over the entire sheet. ✓

Table 14. Charts Used For Comparison

<u>CHART NUMBER</u>	<u>SCALE</u>	<u>EDITION</u>	<u>DATE</u>
16006	1:1,534,076	28 <sup>th</sup>	3/31/84
16011	1:1,023,000	30 <sup>th</sup>	4/2/83
16315	1:100,000	1 <sup>st</sup>	3/9/85

\* A key to sounding origins is included on a mark-up of chart 16315 received with the original Project Instructions, OPR-R184-RA-85, dated 25 January 1985.



Table 15. Comparison With BP-18063 Charted Soundings

<u>BP-18063 SOUNDING</u>	<u>GEOGRAPHIC POSITION</u>	<u>H-10222 SOUNDING</u>
6 Fathoms	58/48.8 N 160/17.7 W	13 Fathoms
8	58/46.0 N 160/14.8 W	14
7	58/47.6 N 160/06.6 W	12
8	58/46.0 N 160/15.0 W	13.3

*see Bristol Bay  
chart Deficiency  
Report attached  
to this report.*

Since we do not know the source of the 1916 document, we can only speculate that it may have been a small scale survey and distortions resulted when depths were transferred to the larger scale chart. ✓

RAINIER recommends that all charted depths originating from survey BP-18063 be removed and replaced with the current survey depths. ✓ *concur*

No special shoal investigations, either by wire drag, wire or pipe sweep, or divers, were conducted. ✓

#### Dangers to Navigation Reports

No Dangers to Navigation Reports were submitted in conjunction with this survey. ✓

#### Non-Sounding Features

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

### Recommendations

Aside from replacement of soundings obtained from prior surveys, no changes to scale, coverage, or format of the published charts for this survey area are recommended.

✓  
concur

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. The public views the yearly update of the provisional chart with current survey data as an example of NOAA's responsiveness to the chart users' needs. Chart users in the north Bristol Bay region eagerly await the addition of these survey data on the next edition of provisional chart 16315.

✓

### M. Adequacy of Survey

This survey is the first basic survey to be conducted over this area. Prior surveys were of reconnaissance nature only. This survey is complete and adequate to supercede the prior surveys.

✓

One east-west 100 meter split on the west side of Crooked Island at latitude 58/43/45 could not be run because of rough sea conditions during the last leg of the project (Figure 2). However, even without the additional development line, the coverage in the area is still sufficient to adequately portray the bottom contours.

✓

In some areas around Summit and Crooked Islands the 0 fathom contour could not be defined because of unfavorable sea conditions encountered during mid and late August. During this time, conditions became unsafe for working along the shoreline in this open ocean area. In particular, a holiday is present southwest of Crooked Island where time and weather constraints did not permit full hydrographic coverage. However, the bottom there is smooth and level enough that the coverage obtained is still sufficient to portray the bottom contours.

✓

Due to time constraints, the northernmost area of the survey sheet, in the section of overlap with sheet K, was squared off at latitude 58/50/00. As the squared off area lies entirely within the limits of sheet K, yet to be surveyed, the survey of sheet S is considered to be complete.

✓

## N. Aids to Navigation

There are no aids to navigation in the survey area, nor any bridges, overhead cables, overhead pipelines, submarine cables, submarine pipelines, or ferry routes. ✓

## O. Statistics

Table 16. Statistics

<u>EDP NO.</u>	<u>NUMBER OF POSITIONS</u>	<u>NAUTICAL MILES OF SOUNDING LINES</u>	<u>SQUARE MILES OF HYDROGRAPHY</u>
2123	<sup>1178</sup> 1238	339.3	26.9
2124	523	103.3	7.8
2125	92	bottom samples	
2126	<sup>0 2 3</sup> 2108	546.0	43.6
2129	6	reference system	
TOTAL	<sup>3810</sup> 3967	988.6	78.3
BOTTOM SAMPLES		: 92	
TIDE STATIONS		: 5	
CURRENT STATIONS		: 3	
VELOCITY CASTS		: 10	
DAYS OF PRODUCTION		: 14	
MAGNETIC STATIONS		: 0	

## P. Miscellaneous

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. ✓

Three current observation stations were occupied within the area of this survey to provide preliminary tidal current information in compliance with the Project Instructions (Table 17). ✓

Table 17. Current Stations

<u>STATION</u>	<u>POSITION</u>	<u>LENGTH OF OBS.</u>	<u>FLOOD DIR.</u>	<u>EBB DIR.</u>	<u>MAXIMUM CURRENT</u>
Crooked Island Bight (A)	58/41.3N 160/15.0W	13 hrs	340°T	150°T	1.0 kts
Crooked Island Bight (B)	58/40.84N 160/14.71W	13 hrs	350°T	140°T	1.5 kts
Summit Island Passage	58/50.8N 160/11.4W	28 hrs	320°T	140°T	1.7 kts

The current was observed to be generally reversing, flooding toward NNE, ebbing toward SSW. The maximum speeds were observed during periods of spring tides. Five other current stations were occupied throughout the entire project area, and further analysis of all RAINIER current observations can be found in the supplemental Current Report, OPR-R184-RA-86. ✓

Water clarity observations were made in the region of this survey and can be found in the Water Clarity Report, OPR-R184-RA-86, forwarded to N/CG241. ✓

The most common bottom samples obtained were fine green sand, with occasional samples of green mud, black clay, and broken shells interspersed. All 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. ✓

## Q. Recommendations

The hydrographer considers field work on this survey to be complete. The RAINIER is not aware of any construction or dredging planned for this area. ✓

## R. Automated Data Processing

Data acquisition and processing were accomplished with a PDP 8/e Hydroplot computer system, using the standard programs for data acquisition and processing (Table 18).

Table 18. Computer Programs Used For Data 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-REAL TIME	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 COMPUTATION	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

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. However, RAINIER verified that the narrow beam data were properly digitized in fathoms. 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). ✓

## S. Referral to Reports

Several supplementary reports contain additional information relevant to this survey (Table 19).

Table 19. Supplementary Reports

<u>TITLE</u>	<u>DATE SENT TO MARINE CENTER</u>
Horizontal Control Report, OPR-R184-RA-86	September 19, 1986 ✓
Coast Pilot Report, OPR-R184-RA-86	September 26, 1986
Marine Mammals Report, OPR-R184-RA-86	September 30, 1986
Corrections to Echo Soundings Report, OPR-R184-RA-86	October 13, 1986
Water Clarity Report, OPR-R184-RA-86	October 14, 1986
Electronic Control Report, OPR-R184-RA-86	October 23, 1986
User Evaluation Report, OPR-R184-RA-86	October 27, 1986
Current Report, OPR-R184-RA-86	November 21, 1986

Respectfully submitted,

*Robert W. Poston*

Robert W. Poston, ENS, NOAA

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## FIELD TIDE NOTE

RA 20-4-86

H-10222

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 $\leq$ 0.002m).
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: <u>Primary</u> - 1. 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. Hydrography on this survey was not run during this period.



2. Between July 31(DN 243) and September 4(DN 247) the gage lost nitrogen supply. During this period the backup gage was in continuous operation.

Backup - Between July 20(DN 201) and July 30(DN 211) was overdampened. Hourly heights were scaled from the primary marigram. Hydrography on this survey was not run during this period.

#### 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

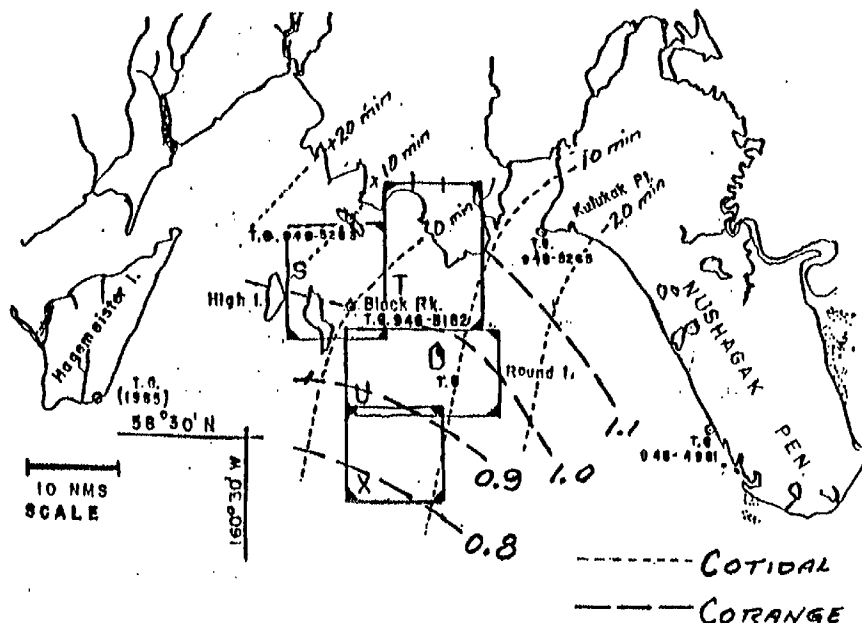
The data from the first five tide stations were obtained from N/OMA via the telephone. They are based on historic data. The Round Island tide station was established on July 9, for seven days with permission from the state observer for the Alaska Department of Fish and Game. However, we were not allowed 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

**MASTER STATION LIST**  
**OPR-R184-RA-86**  
**TOGIAC BAY, ALASKA**  
**H-10222: RA-20-4-86**

104 3	58 36	19285	159 58	33257	250 0430	000000	
ROUND 1948				QUAD 581594	STA 1010		
105 3	58 39	35264	160 15	14580	250 0125	000000	
<del>BOO BOO</del>				RAINIER 1986	FIELD G.P.		
BOO BOO 1985							
106 3	58 46	12764	159 54	28445	250 0075	000000	
RIGHT HAND 1948				QUAD 581594	STA 1008		
108 3	58 49	45084	160 11	15727	250 0240	000000	
SUMMIT 1948				QUAD 581601	STA 1010		
200 3	58 <del>50</del> <sup>42</sup>	<del>49897</del> <sup>10704</sup>	160 <del>13</del> <sup>17</sup>	<del>15720</del> <sup>18642</sup>	250 0151	000000	
CROOKED 1948				QUAD 581601	STA 1002		
201 3	58 50	49897	160 13	15720	250 0151	000000	
SUMMIT 1948 AZ MK				QUAD 581601	STA 1011		
202 3	58 38	21908	160 16	08412	250 0072	000000	
CROOKED 1948 AZ MK				QUAD 581601	STA 1003		
204 3	58 47	13989	159 55	14230	139 0010	000000	
CENTER				RAINIER 1986	FIELD G.P.		
205 3	58 48	14117	159 56	40166	139 0009	000000	
LEFT				RAINIER 1986	FIELD G.P.		
208 3	58 46	17890	159 54	57950	139 0006	000000	
RIGHT HAND 1948 AZ MK				PACIFIC PHOTO PARTY	1983		
209 3	58 53	19521	160 14	32922	253 0000	000000	
DUCE				PHOTO POINT	1983		
211 3	58 41	27950	160 24	10132	250 0008	000000	
LOW				RAINIER 1986	FIELD G.P.		
212 3	58 43	49015	160 23	00322	250 0009	000000	
DRO				RAINIER 1986	FIELD G.P.		

FILE COPY



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

H-10222

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

December 9, 1986

PACIFIC OCEAN CENTER

Action:	Date to MOP
HOPR	
Orig:	CC
HOPR	HOPR1
Remarks	

*Original HOP cover  
HOPR & HOPR2*

TO: N/MOP - Robert L. Sandquist

FROM: S221 - Carl W. Fisher

SUBJECT: Bristol Bay Chart Deficiencies, OPR-R184-RA-86

Upon completion of the 1986 Bristol Bay field season, RAINIER has discovered major discrepancies between charted depths and current survey soundings in the project area. Differences of two to nine fathoms have been noted between current survey soundings and depths shown on the following charts:

Chart	Scale	Edition
16315	1:100,000	2nd Ed., Jan 4/86
16011	1:1,023,000	30th Ed., Mar 9/85
16006	1:1,534,076	28th Ed., Apr 2/83

RAINIER has completed seven survey sheets over the past two field seasons (see attached chartlet) and based on soundings recorded in the project area, it appears that certain source documents for charted depths are unreliable. In 1985, RAINIER was supplied with a markup of chart 16315 which identifies the sources of currently charted depths. These source documents are listed below.

Document	Year	Scale	Description
H-7718	1948	1:100,000	Reconnaissance survey by PATHFINDER
BP-18063	1916	Unknown	Copy unavailable
BP-23186	1930	Unknown	Copy unavailable

Charted depths which originate from the 1948 PATHFINDER survey have found to be in good agreement with RAINIER contemporary soundings. Depths from H-7718 are consistently 0 to 1.5 fm shaller than current survey soundings throughout the range of depths in the project area (0-20 fms).

RAINIER was informed by R. DerKazarian of Operations Branch Rockville that BP-18063 and BP-23186 are old blueprints of



small scale fishermen charts. He stated that these prints are of extremely poor quality. All depths which originate from BP-18063 appear to be grossly in error. The following table lists comparisons between RAINIER soundings recorded during the 1986 field season and depths originating from BP-18063 and shown on chart 16315.

Chart 16315 Depth(fm)	Survey Depth(fm)	Position	Sheet/Registry Number
8	10.3	58° 40' 24" N 160° 02' 24" W	Sheet U / H-10219
6	13	58° 48' 48" N 160° 17' 42" W	Sheet S / H-10222
8	14	58° 46' 00" N 160° 14' 48" W	Sheet S / H-10222
7	12	58° 47' 36" N 160° 06' 06" W	Sheet S / H-10222
8	13.3	58° 46' 00" N 160° 15' 00" W	Sheet S / H-10222
7	13.8	58° 45' 42" N 160° 01' 00" W	Sheet T / H-10220
7*	14.1	58° 43' 18" N 159° 56' 36" W	Sheet T / H-10220

\* The chart markup shows this sounding originating from H-7718. After careful examination of a reproduction of this prior survey, the seven fathom depth was not found. RAINIER believes that an error was made during compilation of the chart markup and that this depth originates from BP-18063.

All of the above BP-18063 depths appear to have been brought through to the smaller scale chart 16011. The attached chartlet shows these depths. Several also appear to have been brought through on chart 16006.

One 12 fathom depth on chart 16315 in RAINIER's survey area originates from BP-23186, 1930. A comparison follows:

Chart 16315 Depth(fm)	Survey Depth(fm)	Position	Sheet/Registry Number
12	7.5	58° 25' 52" N 160° 05' 30" W	Sheet X / H-10216

This depth has also been brought through on chart 16011.



During the 1985 field season, several discrepancies between charted depths and survey soundings were also documented in RAINIER descriptive reports. The 1985 offshore survey area is covered by chart 16011. The following discrepancies were noted in last year's field work.

Chart 16011 Depth(fm)	Survey Depth(fm)	Position	Sheet/Registry Number
12	21	58° 07' 18" N 160° 07' 48" W	Sheet AL / H-10184
12	17	58° 12' 15" N 160° 09' 48" W	Sheet AL / H-10184
15	17	58° 09' 48" N 159° 58' 00" W	Sheet AL / H-10184
10.5	18	58° 13' 30" N 160° 21' 00" W	Sheet W / H-10190

The first two items in the above table have as their source BP-18063. The second two have an unknown source.

It was also determined that the true 20-fathom contour lies six miles north of the charted 20-fathom contour on chart 16011. This observation was based on soundings recorded on Sheet AL.

#### CONCLUSIONS AND RECOMMENDATIONS

All charted depths originating with source documents BP-18063 and BP-23186 appear to be grossly in error. It is recommended that RAINIER soundings be used as the charting source in lieu of older surveys and blueprints in areas that have been surveyed over the past two years.

On chart 16315, in the areas where RAINIER has yet to survey, it is recommended that the currently charted depths with blueprint sources be deleted. It appears that the 1916 blueprint depths, which are shoaler, have been brought through on all charts in lieu of PATHFINDER, 1948 depths. Even though the blueprint depths are shoaler, it has been proven they have no validity. *do we ?*

In areas where RAINIER has not yet surveyed and where PATHFINDER and blueprint soundings exist, it is recommended that PATHFINDER soundings be used as the charting source. Although the PATHFINDER depths are deeper, they have in all cases proven to be adequate for representation of the bottom in these extremely flat areas of Bristol Bay. By charting

*From the BP's*

blueprint soundings which in some cases show depths half as deep as true, RAINIER believes that the validity of other reliable sources used on the current charts are being undermined.

In the areas west and north of High Island the primary source document for charting is BP-18063. The PATHFINDER survey did not cover this area. RAINIER believes that it would be better to show no data in these shoal areas on the present charts rather than showing depths that are known to be erroneous. During the 1987 field season, it would be quite feasible to run LORAN-C controlled reconnaissance lines with RAINIER launches in areas where no depths are currently charted. This would take minimal effort on the ship's part and would certainly be much more accurate than bringing through 1916 blueprint depths.

\* do we/can we cover?

Attachment

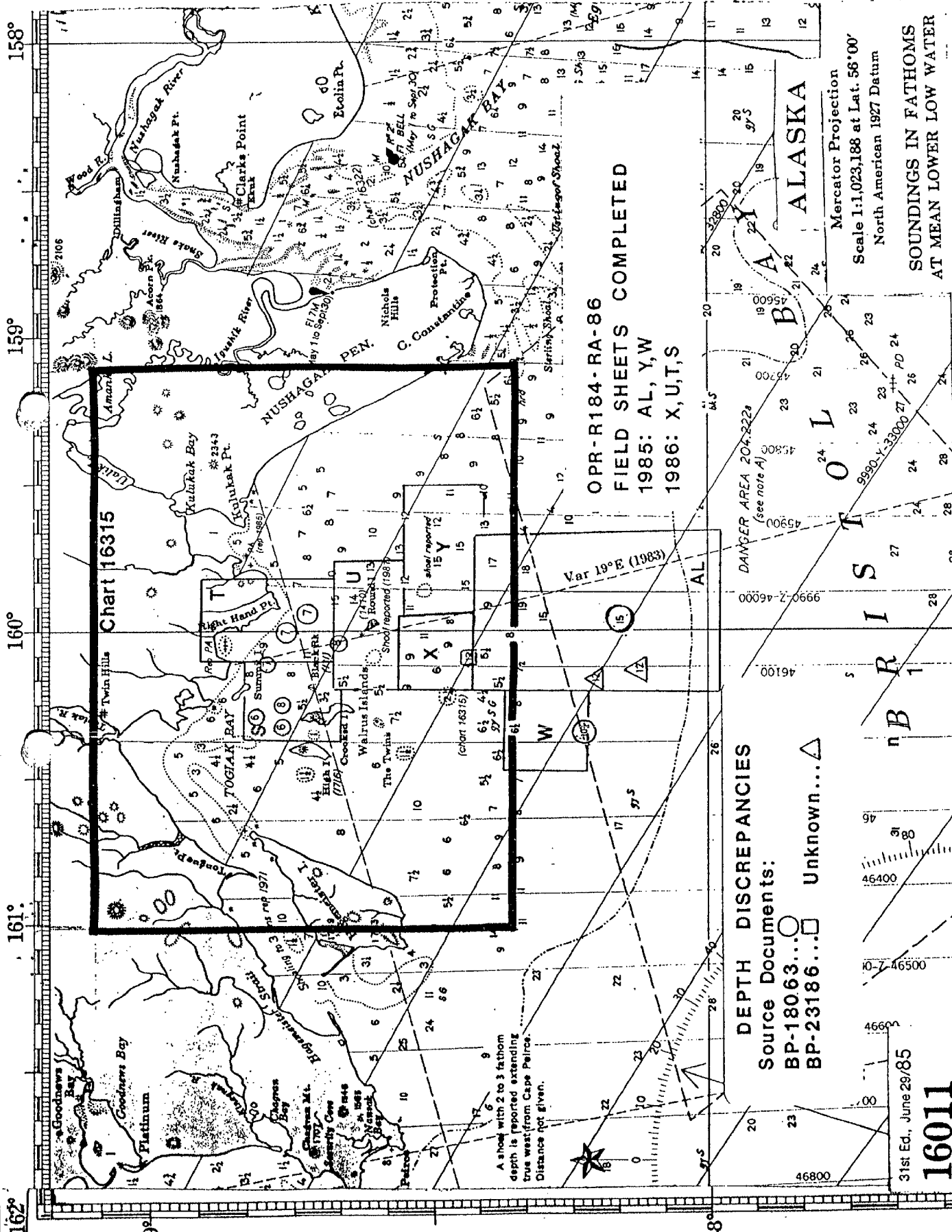


Chart 16315

OPR-R184-RA-86  
 FIELD SHEETS COMPLETED  
 1985: AL, Y, W  
 1986: X, U, T, S

DEPTH DISCREPANCIES

Source Documents:

BP-18063...

BP-23186...

Unknown...

Mercator Projection

Scale 1:1,023,188 at Lat. 56°00'

North American 1927 Datum

SOUNDINGS IN FATHOMS  
 AT MEAN LOWER LOW WATER

A sheet with 2 to 3 fathom depth is reported extending true west from Cape Peirce. Distance not given.

31st Ed., June 29/85

16011

**FILE COPY**

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

March 23, 1987

N/MOP2x1/GEM

TO: Commanding Officer  
NOAA Ship RAINIER

**Original Signed By**

FROM: N/MOP - Robert L. Sandquist

SUBJECT: Waiver of Bi-Monthly Mini-Ranger Baseline Calibrations, OPR-R184

Per section 6.2 of Hydrographic Project Instructions OPR-R184-RA, Togiak Bay, Alaska, CY 1987, the requirement for bi-monthly Mini-Ranger baseline calibrations prescribed in PNC OPCODE Appendix M is waived. Baseline calibrations must be conducted at all other times required by Appendix M including the beginning and end of the project. This waiver was granted to increase efficiency by eliminating the dismantling and subsequent reestablishment of Mini-Ranger setups on mountain peaks in the project area. Critical and non-critical system checks must be closely monitored to ensure continuous agreement with initial baseline correctors. This waiver is only applicable to OPR-R184, Togiak Bay, for CY 1987 operations.

cc: N/CG2  
N/MOP21

## APPROVAL SHEET

### Descriptive Report To Accompany Hydrographic Survey RA-20-4-86 (H-10222)

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

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-10222

**Locality:** Summit Island to Round Island, Bristol Bay, AK

**Time Period:** August 5 - September 4, 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. North of latitude  $58^{\circ}49.0'$  apply a +10 minute time correction and a x1.03 Range Ratio to all heights.
2. South of latitude  $58^{\circ}49.0'$  Zone Direct.

  
Chief, Tidal Datum Quality  
Assurance Section

GEOGRAPHIC NAMES

H-10222

Name on Survey  
ALASKA - BRISTOL BAY  
SUMMIT ISLAND TO  
CROOKED ISLAND

A ON CHART NO. 1604 16011  
B ON PREVIOUS SURVEY NO.  
C ON U.S. QUADRANGLE MAPS  
D FROM LOCAL INFORMATION  
E ON LOCAL MAPS  
F P.O. GUIDE OR MAP  
G RAND McNALLY ATLAS  
H U.S. LIGHT LIST  
K Manuscript

Name on Survey	A	B	C	D	E	F	G	H	K
ALASKA (TITLE)									1
BRISTOL BAY	X								TP-01189 TP-01190
CROOKED ISLAND	X								TP-01190
SUMMIT ISLAND	X								TP-01189
BLACK ROCK	X								5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
						Approved:			17
						<i>Charles E. Harrington</i>			18
						Chief Geographer - N/CG245			19
						JAN 21 1987			20
									21
									22
									23
									24
									25



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

Pacific Marine Center  
1801 Fairview Avenue East  
Seattle, Washington 98115-0070

DEC 1 1986 N/MOP21x2/JDW

TO: Commanding Officer  
NOAA Ship RAINIER

*Robert L. Sandquist*

FROM: N/MOP - Robert L. Sandquist

SUBJECT: Preprocessing Examination of H-10222, Alaska,  
Bristol Bay, Summit Island to Crooked Island

Hydrographic survey H-10222 has been reviewed in accordance with Hydrographic Survey Guideline No. 15, and the Preprocessing Examination Critique for this survey is attached. Survey H-10222 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

November 28, 1986 N/MOP21x2/JDW

TO: N/MOP - Robert L. Sandquist

FROM:   
N/MOP 21 - Thomas W. Richards

SUBJECT: Preprocessing Examination for H-10222

I. SURVEY INFORMATION

- A. Field No. RA-20-4-86 Registry No. H-10222
- B. State: Alaska  
General Locality: Bristol Bay  
Sublocality: Summit Island to Crooked Island
- C. Project Instructions: OPR-R184-RA-86  
Original dated: April 16, 1986  
Change No. 1 dated: May 23, 1986
- D. Date:  
Field Work Commenced: August 6, 1986  
Field Work Completed: September 5, 1986  
plus 6 weeks = October 17, 1986  
Data received at Marine Center: November 14, 1986\*  
plus 1 month = December 15, 1986  
Examination critique transmitted to field December 1, 1986  
Target for completion of Marine Center processing May 1, 1987

\* Permission granted on October 21, 1986 to exceed 6-week submission deadline.



## II. PREPROCESSING EXAMINATION CRITIQUE

Hydrographic survey H-10222 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, ENS O'Mara, ENS Hartzell, and ENS Fellows.

### A. Danger to Navigation Report

There were no dangers to navigation reported by RAINIER for the area covered by H-10222.

No additional dangers were identified during the preprocessing examination.

### B. Compliance with Instructions

This survey meets the requirements for a basic hydrographic survey.

### C. Final Field Sheets

Delineation of shoreline features was excellent. Procedures required by the PMC OORDER were met. Designation of foul areas which did not exist on the shoreline manuscript appears to be appropriate due to the extreme complexity of the area.

### D. Descriptive Report

The Descriptive Report was extremely well-written and informative.

Carto Code listings for shoreline features should include reference-numbered features (PMC OORDER Appendix Q).

### E. Echograms

Annotation of echograms was excellent.

### G. Sounding Correctors

The Corrections to Echo Sounding Report was examined during this evaluation; no significant problems were detected.

### J. Positioning Control

The Electronic Control Report was examined during this evaluation; no significant problems were detected.

### L. Automated Data Check

Spooling of H-10222 revealed a significant improvement in shipboard processing. There were no time-sequence errors on corrector tapes.

N. Survey Acceptance

The preprocessing examination for H-10222 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-10222 is in compliance with the project instructions. I recommend that H-10222 be accepted for Nautical Chart Branch processing.

Prepared by:

  
John D. Wilder

**HYDROGRAPHIC SURVEY STATISTICS**

H-10222

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		6
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		5
DESCRIPTION	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):

PHOTOBATHYMETRIC MAPS (List):

NOTES TO THE HYDROGRAPHER (List):

SPECIAL REPORTS (List):

NAUTICAL CHARTS (List):

**OFFICE PROCESSING ACTIVITIES**

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

PROCESSING ACTIVITY	AMOUNTS			
	VERIFICATION	EVALUATION	TOTALS	
POSITIONS ON SHEET			3967	
POSITIONS REVISED				
SOUNDINGS REVISED			347	
CONTROL STATIONS REVISED				
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS	131.0		131.0	
VERIFICATION OF SOUNDINGS	154.0		154.0	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	50.0		50.0	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		12.0	12.0	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		55.0	55.0	
GEOGRAPHIC NAMES				
OTHER: <b>Digitizing</b>				
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	335.0	67.0	402.0

Pre-processing Examination by <b>LT J.D. Wilder</b>	Beginning Date	Ending Date 11/28/86
Verification of Field Data by <b>J. Shofner</b>	Time (Hours) 335.0	Ending Date 9/16/87
Verification Check by <b>J. Stringham, B. Olmstead</b>	Time (Hours) 35.0	Ending Date 9/16/87
Evaluation and Analysis by <b>A. Luceno</b>	Time (Hours) 67.0	Ending Date 9/24/87
Inspection by <b>D. Hill</b>	Time (Hours) 3	Ending Date 9/24/87

PACIFIC MARINE CENTER  
EVALUATION REPORT  
H-10222

1. INTRODUCTION

H-10222 is a basic hydrographic survey accomplished by the NOAA Ship RAINIER under the following project instructions.

OPR-R184-RA-86, dated April 16, 1986  
Change Number 1, dated May 23, 1986  
Change Number 2, dated August 8, 1986

This survey covers a part of the approach to Togiak Bay at the upper section of Bristol Bay. The northern portion of Crooked Island, the southern part of Summit Island, and Black Rock, are within the surveyed area. Depths range from zero to 17.9 fathoms, the deepest depth located in the channel between Crooked Island and Summit Island. Numerous detached rocks awash lie close to the eastern shore of Crooked Island and up to about 240 meters off-shore from the northern shore of Black Rock. The bottom of the surveyed area is usually flat, gently sloping and generally sandy with some mixtures of broken shells, pebbles and gravel.

The final field sheet shows twisting depth curves around Crooked Island thought to result from rough sea conditions during the field work in gently sloping smooth bottom and the use of predicted tides. However, this anomaly was eliminated during office processing when the final corrections to the soundings were applied.

Field processing used predicted tides for Black Rock, Walrus Islands, Alaska. A tide gage was installed at Round Island for zoning of predicted tides for the surveyed area. Office processing used approved hourly heights zoned from the gages at Black Rock (946-5182), Kulukak Point (946-5265), Nushagak Peninsula (946-4961), and NE side Summit Island (946-4961).

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. TRA and electronic control correctors are adequate. Revised velocity correctors are derived results from rescanning the velocity correction graph. An accompanying computer printout contains the revised data.

A digital file, generated for this survey, includes categories of information required to comply with N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, September 7, 1983. Certain descriptive information, however, may not be 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

Sections F and G of the hydrographer's report and the Horizontal and Electronic Control Reports for OPR-R184-RA-85 and 86 contain adequate discussions of horizontal control and hydrographic positioning.

Positions of horizontal control stations used during hydrography are 1948 published and 1983, 1985 and 1986 field values based on 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 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 : 2.783 seconds (86.1 meters)  
 Longitude : -7.914 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 12 weak fixes (angles of intersection less than 30 degrees or more than 150 degrees) noted on this survey. However, there are no significant plotting anomalies between these fixes and the standard acceptable positions in the adjacent areas. Also, none of these fixes are used to position dangers to navigation. These fixes are considered acceptable.

The following registered Class III maps are applicable to this survey.

	<u>Scale</u>	<u>Date of Photography</u>
TP- 01190	1:20,000	July 1983
TP- 01186	1:20,000	July-August 1983

Verification of shoreline details depicted on these manuscripts is discussed in Section H of the hydrographer's report. Changes and additions to the manuscripts shown on the field sheet have been applied to the smooth sheet.

### 3. HYDROGRAPHY

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 and;
- c. Show that the survey was properly controlled and soundings plotted correctly.

### 4. CONDITION OF SURVEY

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the PMC OPODER except as noted in the Preprocessing Examination Report dated December 1, 1986 (copy appended).

5. JUNCTIONS

H-10222 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10219	1986	1:20,000	Southeast
H-10220	1986	1:20,000	East
H-10248	1987	1:20,000	North

Soundings are in good agreement with junction sheets H-10219 and H-10220. These junctions are complete.

The junction with sheet H-10248 is not complete. Shipboard processing of this sheet is ongoing. The junction will be addressed in the report for H-10248.

There are no contemporary surveys to the west and the southwest. No comparison is possible with the chart since the chart is devoid of soundings in these areas.

6. COMPARISON WITH PRIOR SURVEYS

H-7718 (1948) 1:100,000

H-7718, the main source of the charted soundings, is a reconnaissance survey. Depths between the two surveys generally agree to within one fathom, the shoaler soundings coming from H-7718. Some of these differences in depth can be attributed to differences in rounding techniques.

AWOIS item 50912 - The 1/2-fathom depth at latitude 58°42'50.00"N, longitude 160°20'00.00"W originates with H-7718. The disposition of this depth is adequately discussed in Section K of the hydrographer's report.

H-10222 is adequate to supersede H-7718 within the common area.

7. COMPARISON WITH CHART

Chart 16006, 28th Edition, dated 3/31/84; scale 1:1,534,076

Chart 16011, 30th Edition, dated 4/2/83; scale 1:1,023,000

Chart 16315, 2nd Edition, dated 3/9/85; scale 1:100,000

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

a. Hydrography - Most soundings and offshore information on the first three charts mentioned above originate with H-7718. Comparison between H-10222 and H-7718 is sufficiently discussed in Section 6 above and Section K of the hydrographer's report.

Hydrographic information on the 3rd Edition of chart 16315 originates with the field sheet for this survey. No critical discrepancies exist between this chart and the final field sheet.

H-10222 is adequate to supersede charted hydrography within the common area.

b. AWOIS <sup>?</sup> AWOIS Item 51031, a 2.5-fathom shoal reported in 1985 at latitude 58°44'00.00"N, longitude 160°19'00.00"W, is adequately discussed in Section K of the hydrographer's report.

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

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

e. Geographic Names - Names appearing on the smooth sheet have been approved by the Chief Geographer and are plotted in accordance with these charts.


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

8. COMPLIANCE WITH INSTRUCTIONS

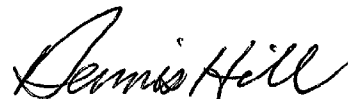
H-10222 adequately complies with the project instructions mentioned in Section 1 of this report.

9. ADDITIONAL FIELD WORK

This is a good basic hydrographic survey. No additional field work is recommended.

  
Arsenio A. Luceno  
Cartographer

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

  
Dennis Hill  
Chief, Hydrographic Section



Addendum for H-10222

CHANGE NO. 5 to Project Instructions OPR-R184-FA, dated March 6, 1987, amended section 6.10 of the instructions to require a comparison with the prior shoreline maps.

This CHANGE, dated July 19, 1988, was received subsequent to the completion of survey processing. Accordingly, the required comparison was made using a copy of the smooth sheet.

The Evaluation Report, section 6, is supplemented as follows:

T-9242 (1948) 1:20,000

T-9248 (1947) 1:20,000

These prior shoreline maps cover the northern portion of Crooked Island and the southern tip of Summit Island. Survey H-10222 was compared to these prior shoreline maps and no changes were noted. Survey H-10222 is adequate to supersede these prior shoreline maps as a charting source for the area of common coverage.

ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10222

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.

James W. Evans 9/30/87  
Chief, Nautical Chart Branch (Date)

CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE:

Robert L. Sandt 9/30/87

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.

Robert L. Sandt 9/30/87  
Director, Pacific Marine Center (Date)

