

10190

Diagram No. 8802-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. RA-20-4-85
Office No. H-10190

LOCALITY

State Alaska
General Locality Bristol Bay
Locality 20 Miles South of Crooked
Island
1985
CHIEF OF PARTY
CAPT J.P. Vandermeulen

LIBRARY & ARCHIVES

DATE August 19, 1986

☆U.S. GOV. PRINTING OFFICE: 1980-766-230

CC96-A-5
CHTS

16315

16011

16006

TO SIGN OFF SEE
"RECORD OF APPLICATION"

HYDROGRAPHIC TITLE SHEET

H-10190

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 20-4-85

State Alaska

General locality Bristol Bay

Locality 20 miles South of Crooked Island

Scale 1:20,000 Date of survey August 5 - 27, 1985

Instructions dated April 30, 1985 Project No. OPR-R184-RA-85

Vessel RAINIER S221 (2120)

Chief of party Captain J.P. Vandermeulen, NOAA

Surveyed by LT Konrad, LT(jg) Pickett, ENS Griffin, ENS LaReau, ENS Porta, ENS Brown

Soundings taken by echo sounder, ~~XXXXXXXXXX~~ DSF 6000N

Graphic record scaled by RAINIER personnel

Graphic record checked by RAINIER personnel

Verification PM

Produced by M. Sanders Automated plot by Xynetics Plotter

Evaluation XXXXXXXXXX

Verification by Gordon E. Kay

Soundings in fathoms XXXX at XXX MLLW and tenths of fathoms

REMARKS: Marginal Notes in black were made during the evaluation of H-10190 at
the Pacific Marine Center, Seattle, Washington. Separates are filed in the back of
the accordian folder.

STANDARDS CK'D 8-21-86

C. Kay

✓ AWOIS and SURF RUD 8/86

SP4-8-97
K.W.

PROGRESS SKETCH

OPR - RI84 - RA - 85

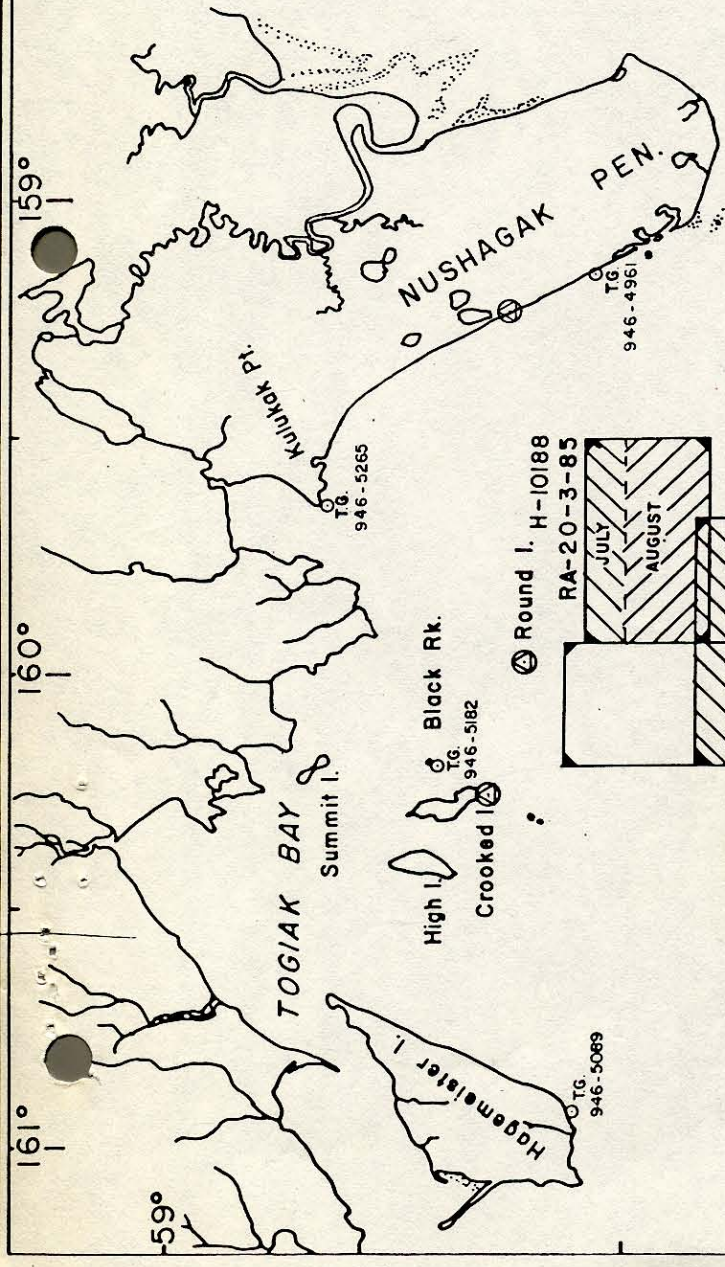
HYDROGRAPHIC SURVEY
TOGIAK BAY, ALASKA

JUNE 7 - AUGUST 27, 1985

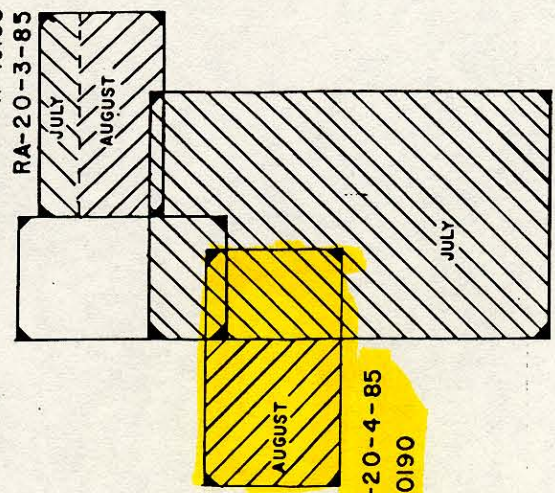
NOAA SHIP RAINIER

JOHN P. VANDERMEULEN, CAPT., NOAA
COMMANDING

FROM CHART 16011



Round I. H-10188
RA-20-3-85



B R I S T O L B A Y

JUNE	JULY	AUG.	
—	434.5	135	SQ.N.M. Sounding
—	672.9	611	L.N.M. Misc. Distance
—	2774.8	469.7	L.N.M. Sounding
31	39	115	Bottom Samples (Grab)
4	—	—	Control Station (Electronic)
—	1	2	Temp., Depth, Sound Velocity
—	—	—	Nansen Cast
4	—	—	Tide Gages
1	—	—	Stations Located by Traverse
—	2	4	Water Samples Analyzed
—	—	—	SQ.N.M. Side Scan Sonar
—	—	—	L.N.M. Side Scan Sonar

A. PROJECT

Basic hydrographic survey H-10190, sheet RA-20-4-85, was accomplished in accordance with Project Instructions OPR-R184-RA-85, Togiak Bay, Alaska, dated April 30, 1985. ✓

B. AREA SURVEYED

The area is bounded by latitudes 58/22/00 N and 58/13/30 N, and longitudes 160/12/00 W and 160/27/00 W. The area was surveyed to a scale of 1:20,000 and lies 16 - 24.5 nm south of Crooked Island in Bristol Bay. Survey operations were conducted from August 5 (DN 217) to August 27 (DN 239), 1985. ✓

C. SOUNDING VESSELS

All sounding data and bottom samples for this survey were obtained by the RAINIER (2120). No unusual sounding vessel configurations occurred during the acquisition of hydrographic data. The RAINIER (2120) was utilized for all sound velocity casts. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

Sounding Equipment

The RAINIER was equipped with Raytheon DSF-6000N dual-beam echo sounders, serial numbers A119N and A117N. Depths for this survey ranged from 5 to 20 fathoms. ✓

Settings for the DSF-6000 echo sounders throughout the survey were as follows:

RANGE SCALE: 0 - 25 fm (Phase 1)

20 - 45 fm (phase 2)

CHART SPEED: 30 mm/min

FUNCTION: High + Low (High frequency digitized)

GAIN SETTINGS: Manual

Sounding Equipment Failures

In general, the DSF-6000N echo sounders performed adequately during the course of the survey. On August 23, 1985 (DN 235) the stepper motor of echo sounder A117N malfunctioned. This echo sounder was replaced with A119N. About an hour later the initialized print switch on echo sounder A119N failed. ✓

Echo sounder A117N was reinstalled after the stepper motor was repaired. ✓

Data quality was not impaired by these failures as junctions between sounding lines recorded with different echo sounders agreed well. ✓

Transducer Depth and ANDIST

All soundings were recorded with the starboard aft transducer of the RAINIER with Raydist range-range control. The ANDIST associated with this transducer is 32.2 meters. *Has been Applied* ✓

A transducer depth of 2.3 fathoms was used to correct all soundings in this survey. This value has been used in prior surveys and can be derived from plans of the RAINIER. The transducer depth was verified using a 3D Instruments pneumatic gage (S/N 8504192). On July 29, 1985, divers placed the orifice of the pneumatic gage alongside the transducer. Measurements were recorded before and after fueling resulting in an average transducer depth of 2.3 fathoms for the aft transducers. ✓

TC/TI tapes were made in accordance with PMC OPORDER Appendix Q. Printouts of the TC/TI tapes are included in the separates following the text. ✓

Sound Velocity-Settlement and Squat Corrections

Velocity corrections were derived from three Plessy 9040 SV/D/T profiling system casts:

<u>Cast Number</u>	<u>Date</u>	<u>Position</u>
1	11 July 85 (DN 192)	57/58/35.6 N 159/59/58.7 W
2	5 Aug 85 (DN 217)	58/56/25.0 N 159/56/25.0 W
3	27 Aug 85 (DN 239)	58/00/00.0 N 160/13/00.0 W

CASTS 2+3 AVERAGED To Produce TABLE #3 USED ON THIS SURVEY

A table of velocity corrections (Table NO. 3) was created by averaging casts 2 and 3. The maximum velocity correction in this survey is +0.2 fathoms. The final field sheet was plotted with a preliminary velocity correction table based on the first cast. Printouts of the velocity tables are included in the separates following the text. ✓

The transducer depth and sound velocity corrections were checked with leadline casts taken at various depths. The quality of the leadline comparisons was generally poor due ✓

to current and sea conditions throughout the survey area. Comparisons made at shallower depths generally confirmed the 2.3 fathom transducer depth. Insufficient precision in the comparisons measured at deeper depths made verification of the small velocity correction impossible. ✓

Settlement and squat trials were conducted with the RAINIER on August 26, 1985. A LORAN-C controlled line was run over an area with a nearly flat bottom near Kulukak Point. Depth readings were recorded at the same three locations along the line while running at the following speeds: 0 rpms, 120 rpms (10 ft pitch), 150 rpms (10 ft pitch), and 180 rpms (10 ft pitch). The tide level was monitored during the trials. Results showed that the settlement and squat correctors for the RAINIER were less than 0.1 fathoms and were not applied to soundings. ✓

Calibration information regarding the Plessy 9040 SV/D/T and the 3D Instruments pneumatic gage can be found in the Corrections to Echo Sounding Report, OPR-R184-RA-85. ✓

Corrections Due to Sea Surface Conditions

Throughout the survey area, a regular sand and mud bottom was observed. Irregularities in the graphic record were generally due to sea conditions. Corrections for sea action were necessary for about 5 percent of the digitized soundings. Depths which digitized on or near the crests or troughs of waves were replaced with soundings scanned from the graphic record. The following guidelines were used in scanning out sea action: ✓

1. In depths greater than 10 fathoms: If the digitized depth differed from the mean sea action depth by more than 0.2 fm, the sounding was changed to compensate for sea action. ✓

2. In depths less than 10 fathoms: If the digitized depth differed from the mean sea action depth by more than 0.1 fm, the sounding was changed to compensate for sea action. ✓

On Days 218, 219, 225, 234, and 235 up to 80 percent of the digitized soundings were corrected for sea action. During this period, sea action averaged about 1 fathom. This condition at times exceeded the recommended operations cutoff outlined in Hydrographic Survey Guideline No. 31. Because of the extreme flatness of the bottom in this area it was determined that the graphic record could be scanned adequately and sounding operations continued. Tide Reduction of Data ✓

Preliminary plots using tide correctors furnished in the project instructions resulted in crosslines and splits that disagreed with main scheme lines by 1 - 2 fathoms. During ✓

the course of the project, by analyzing real time tides, it was determined that the predicted tides for Black Rock reasonably reflected the tidal cycle in the immediate area. Therefore, predicted tides for Black Rock, derived directly from the 1985 Tide Tables were used to plot the final field sheets. By using these tide correctors, disagreements were reduced to not more than 1 fathom in all cases. ✓

The mainscheme lines in this survey were run with 400 meter spacing then later split to 200 meter spacing. The time delay in running the lines caused jagged contour lines, which indicates problems in the predicted tides from the Black Rock gage. It is expected that when the final tide correctors are applied during processing, the contours will be smoothed out. ✓

E. HYDROGRAPHIC SHEETS

Two 1:20,000 scale plotter sheets designated RA-20-4E-85 and RA-20-4W-85 were prepared on the RAINIER with the PDP 8/e Hydroplot system which draws a modified transverse mercator projection. There are no larger scale expansion sheets. The final field sheets were prepared by AST Mike Converse. A list of parameters used to define the field sheets are provided in the separates following the report. ✓

All data and accompanying field records will be forwarded to the Pacific Marine Center for verification. ✓

F. CONTROL STATIONS

Three Class I Control Stations used for this survey were established in 1947 and 1948. Stations recovered and used for electronic control sites or calibration sites are as follows: ✓

<u>Signal #</u>	<u>Station</u>	<u>Class I</u>
100	CROOKED 1948 AZ. MK ECC.	
101	PENINSULA 1947 AZ MK	2nd Order OFF SHEET limits
202	CROOKED 1948 AZ MK	2nd Order " " "
104	ROUND 1948	3rd Order " " "

Adjusted positions (Nov. 1976) for these stations were provided by NGS. Positions of CROOKED 1948 AZ MK and ROUND 1948 were verified by ground survey methods commensurate with Section 3.1.1.2 of the Hydrographic Manual. PENINSULA 1947 AZ MK was recovered in 1983 by PMC Photogrammetry Section and found to be in good condition. ✓

Station BOOB00 1985 (105) was established and located to Third Order Class I Standards for use as a calibration sight. CROOKED 1948 AZ MK ECC (100 & 102) was located for use as a Raydist site. Details of the location and ✓

verification of horizontal control can be found in the Horizontal Control Report for OPR-R184-RA-85. ✓

All positions in the survey are based on the 1927 North American Datum. ✓

G. HYDROGRAPHIC POSITION CONTROL

This survey was conducted using the range-range method of position control. Hastings-Raydist ranging equipment was used for positioning all sounding lines. ✓

Some of the bottom samples were positioned using LORAN-C. The LORAN-C time delays were converted to Raydist ranges by using programs RK-321 and RK-300. Lattice correctors were applied to the LORAN positions. These correctors were determined from Raydist positioning data as detailed in Section P. ✓

Motorola Mini-Ranger III equipment was used for setting and periodically checking the lane count on the Raydist equipment. Wild T-2 Theodolites were used for calibrating the Mini-Ranger equipment. A list of all equipment serial numbers follows: ✓

Wild Theodolites

T-2 #75599E ✓

T-2 #68648

Motorola Mini-Ranger III Equipment

Console #711

R/T Unit #C1712 ✓

Codes

1 - #C1883

E - #911721

F - #911711

D - #1569

B - #1628

O - #01789 ✓

Hastings-Raydist Equipment

DR-S System Navigator Model ZA-67A #58

Transmitter Model TA 96B #167 Frequency - 3296.495 kHz

Red Shore Station #233 Frequency - 1648.015 kHz

Green Shore Station #120 Frequency - 1648.425 kHz ✓

Gould Strip Chart Recorders

Model 220 #11662

Model 220 #11314

The Raydist shore stations and Mini-Ranger codes were set up on the following stations:

Raydist Red - Signal 100, CROOKED 1948 AZ MK ECC
Raydist Green - Signal 101, PENINSULA 1947 AZ MK

Mini-Ranger Codes

I - Signal 105, BOOBOO 1985 (From August 22 - DN 234)
D - Signal 102, CROOKED 1948 AZ MK ECC
O - Signal 103, PENINSULA 1947 AZ MK
E - Signal 104, ROUND 1948
B - Signal 105, BOOBOO 1985 (Until August 22 - DN 234)

Mini-Ranger Calibration

On May 24 (DN 144), 1985, an opening baseline calibration for the Mini-Ranger equipment was conducted in Juneau, Alaska, following the specifications of PMC Order, Appendix M. A closing calibration will be conducted at the conclusion of operations. The Mini-Ranger system checks were performed by the theodolite intersection method. A system check was performed prior to data acquisition for this survey on 1 August (DN 213) for codes B and D. No significant deviation from the base line calibration results was detected. A closing system check was performed on August 22 (DN 234), with similar results.

No system check was performed for code O due to the lack of control in the area. This code was used for direct comparisons with the green Raydist station, which was initially calibrated using codes D and B (1 after DN 234), and upon computing a direct comparison, the range from code O was in close agreement with the observed Raydist range. This provided an indirect check on code O's performance.

Code E was used for on-line checks of the lane count, and for RK-561 calibrations. Its performance was checked at the beginning of the project with a theodolite intersection calibration, however, it was not calibrated at the beginning of survey work on this sheet due to the fact that it was not being received at the time that codes B and D were calibrated. Its performance was verified in the same manner as code O's.

Raydist Calibration

The Raydist lane counts were set and checked using the Mini-Ranger system and program RK-561. These calibrations were performed on the following dates:

August 5 (DN 217)
August 6 (DN 218)
August 7 (DN 219)
August 13 (DN 225)
August 14 (DN 226)
August 22 (DN 234)
August 23 (DN 235)
August 24 (DN 236)

In addition to periodic calibrations of this type, numerous direct comparisons were performed during data acquisition. These were performed by recording the Mini-Ranger range from the code mounted on the Raydist tower at the station being checked, and then dividing the range by 45.453 meters/lane to obtain the equivalent Raydist lane count. These comparisons were recorded on the data printouts as they were being performed.

Another type of lane count check was also performed during data acquisition. This check consisted of recording a Mini-Ranger range from a third, independent station when the Hydroplot system recorded its Raydist fix. The Raydist ranges were used to compute an X-Y position with program RK-300, and then a distance was computed from the independent station to this X-Y position. This computed distance was then compared to the observed Mini-Ranger range, verifying the lane count. These verifications were also recorded on the data printouts.

Raydist Correctors

The final field sheets were plotted using the average of the opening and closing correctors for the period during which the data were acquired. For instance, the data acquired between the dates of August 5 and August 6 were plotted using an average of the corrector values obtained from the calibrations of August 5 and August 6.

<u>Date</u>	<u>JD</u>	<u>Red</u> <u>Corrector</u>	<u>Green</u> <u>Corrector</u>	<u>Av Red</u> <u>Corrector</u>	<u>Av Green</u> <u>Corrector</u>
5 August	217	-0.12	-0.34		
6 August	218	-0.33	-0.40	-0.23	-0.37
6 August		-0.33	-0.40		
6/7 August	*	-0.04	-0.15	-0.19	-0.28
7 August	219	-0.22	-0.21		
7 August	*	-0.12	-0.05	-0.17	-0.13
13 August		+0.02	+0.13		
14 August	226	-0.29	+0.31	-0.14	+0.22
22 August		+0.19	+0.17		
23 August	235	+0.41	-----	+0.30	+0.17
24 August		+0.07	+0.50		
24 August	236	+0.12	+0.33	+0.10	+0.42

* Denotes average of on line comparisons.

Raydist Failures

Several atmospheric related failures occurred during data acquisition for this survey. The first of these failures took place on August 7 (DN 219) at time 5:25:15 UTC. At that time, both of the Raydist channels were lost, that is, the phase meters stopped rotating for an extended period of time. When the failure initially took place, the line was broken, but the ship's course and speed were maintained so that a lane count could be determined from the strip chart record. After two to three minutes, it was decided that the failure might be more than a temporary loss of the signal, and the ship was stopped. After about five minutes, the phase meters began turning again, and it was determined that the loss of signal was due to weather, as there was a front moving through the area at the time. The phase meters were re-set, and a new calibration was performed. The lane count for the data acquired prior to the failure was verified by checking the on line comparisons. An average of these comparisons was used for plotting the final field sheet, and they appear in the table above.

The second failure occurred on the same day as the first failure, and in much the same way. The failure took place at time 10:37:23 UTC. At that time the phase meters stopped, and it was decided at that time that weather and sea conditions had deteriorated to the point where reliable data could not be acquired. The ship left the survey area in order to ride the storm out. As in the previous case, an

average of the on line comparisons was used for plotting the final field sheet.

The third failure took place on August 23 (DN 235) at time 18:09:41 UTC. This time the "Green" channel phase meter stopped for approximately one minute at the beginning of a line. After the phase meter resumed turning, the ship was stopped in order to determine how many lanes were lost. At that time, however, it was decided that the weather and sea conditions were too rough once again, and the ship proceeded to Summit Island in order to find a safe anchorage. An average of 10 direct comparisons on the "Red" channel verified its partial corrector, but a comparison was not obtained for the "Green" channel in order to verify its lane count. The strip chart records were re-examined to check for any lane losses that might have been missed. The final field sheet was plotted using only the opening partial corrector for the "Green" channel. ✓

Finally, in addition to the total losses of signal, as detailed above, a loss of one lane took place on August 14 (DN 226). The loss became apparent during a closing calibration, after surveying had been completed for the day. The calibration revealed a corrector of +1.56 for the "Green" channel. The strip chart records were examined, and the loss was found to have occurred after the last survey line had been run. A partial corrector of +0.56 was used in plotting the final field sheet. ✓

For further information refer to the Electronic Control Report, OPR-R184-RA-85.

H. SHORELINE

There is no shoreline within the limits of this survey. ✓

I. CROSSLINES

A total of 39.7 nm of crosslines, comprising 5.9 % of total hydrography, were run on this survey. In all cases, comparisons between mainscheme and crossline hydrography were within one fathom. *See E.R., Sect. 3* ✓

J. JUNCTIONS

This survey junctions with one contemporary survey. Survey RA-20-4-85 (H-10190) junctions to the west with survey RA-40-1-85 (H-10184). The junction with RA-40-1-85 was accomplished by running east-west mainscheme hydrography. No irregularities in contours exist at the junction points. ✓

K. COMPARISON WITH PRIOR SURVEYS

Survey RA-20-4-85 (H-10190) was compared to one prior survey; H-7718 (1:100,000, 1948). All soundings from the prior survey within the limits of this survey were used for comparison. Agreement was within one fathom with one exception: ✓

<u>Depth from H-7718</u>	<u>Depth from H-10190</u>	<u>H-7718 Lat/Lon</u>
6.7 fm	7.8 fm	58/21/430 N
	⁷⁴ 6.9 fm	160/15/30 W

Pos. #168012 Lat. 58°21'32.60"N, Long. 160°15'59.25"W

Recommendation: The depth from survey H-10190 should supersede the prior survey depth for charting purposes. *CONCUR*

L. COMPARISON WITH THE CHART

Survey RA-20-4-85 (H-10190) was compared with the following charts: ✓

<u>Chart Number</u>	<u>Scale</u>	<u>Edition</u>	<u>Date</u>
16011	1:1,023,188	30 th	4/2/83
16315	1:1,000,000	1 st	3/9/85

SEE EVALUATION REPORT SECTION 7

All soundings from the charts within the limits of this survey were used for comparisons. Agreement was within one fathom with the exception of a 10.5 fm sounding on Chart 16011 that lies at the southern edge of this survey: ✓

<u>Charted Depth</u>	<u>Survey Depth</u>	<u>Lat/Lon</u>
10.5 fm	18 fm	58/13/30 N
		160/21/00 W

The charted depth does not appear on any prior surveys supplied to the RAINIER and has no known source. It is recommended that the survey depth supersede the charted depth and the 10.5 fm depth be removed from the chart. *CONCUR*

The bottom in the area of this survey slopes gradually from North to South with the southernmost depths ranging from 16 to 20 fathoms. This indicates that the charted position of the 20-fathom curve is approximately 10 nm south of the true 20-fathom curve. ✓

M. ADEQUACY OF THE SURVEY

This survey is complete and adequate to supersede all prior surveys for charting purposes. *CONCUR*

N. AIDS TO NAVIGATION

There are no aids to navigation within the limits of this survey, and none are recommended. ✓

O. STATISTICS

Linear nautical miles of hydrography	676.6 nm
Square nautical miles of hydrography	68.2 nm sq
Number of positions	2226
Bottom samples	488
Velocity casts	3
Tide stations	4

P. MISCELLANEOUS

LORAN-C data were acquired in conjunction with hydrography for 100% of the survey. A sample of 15 time delays was taken from the lines run on this survey and checked for accuracy in the following manner. Program RK-300 was used to compute a G.P. from the Raydist rates, and then program RK-321 was used to compute time delays from the G.P.'s. An error value was then determined by subtracting the computed time delays from the observed time delays. The errors for all 15 samples were averaged and a standard deviation was computed. From this average, a positional corrector in terms of a range and azimuth was computed. ✓

	<u>Mean Error</u>	<u>Std Dev</u>	<u>Max Error</u>	<u>Min Error</u>
9990-Z	+ 2.37	0.16	+ 2.67	+ 2.10
9990-Y	+ 2.42	0.10	+ 2.56	+ 2.23

Distance: 612.8 m Azimuth: 036/33/21.71

As per section 6.8 of the project instructions, all bottom samples have been sent to the Smithsonian Institution.

This survey overlaps with a charted danger area to the south. The Air Force uses this area to conduct missile tests. The operations officer at Elmendorf AFB in Alaska was contacted and informed of our planned survey operations. ✓

Q. RECOMMENDATIONS

This survey is complete and no additional field work is required. *CONCUR*

R. AUTOMATED DATA PROCESSING

Data acquisition and processing were accomplished in accordance with the Hydrographic Manual (Fourth Edition), Manual of Automated Hydrographic Surveys, the PMC OPORDERS, Hydrographic Survey Guidelines and the Hydrographic Data Requirements for 1985. ✓

Soundings and positions were collected by a Hydroplot system using the Hyperbolic Range/Range Hydroplot program Rk 112. Daily master tapes and corresponding corrector tapes include ✓

the TRA for the sounding vessels, electronic control correctors for the Raydist green and red stations, and all depth corrections. Velocity tapes were generated from SV/D/T cast data. The following is a list of all computer programs version dates used for data acquisition or processing:

<u>Number</u>	<u>Description</u>	<u>Version</u>
RK 112	Hyperbolic, R/R Hydroplot	4/23/84
RK 201	Grid, Signal, and Lattice Plot	4/18/75
RK 211	Range/Range Non-Real Time Plot	2/13/84
RK 300	Utility Computations	10/21/80
RK 321	LORAN-C 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
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	12/01/82
RK 612	Line Printer List	3/22/78
RK 900	Plot Test Tape Generator for AM902	5/07/76
RK 901	Core Check	3/01/72
AM 902	Real Time Checkout	11/10/72
DA 903	Diagnostic-Instruction Time	2/27/76
RK 905	Hydroplot Controller Checkout	3/18/81
RK 935	Hydroplot Hardware Tests	3/15/82

S. REFERENCE TO OTHER REPORTS

The following reports contain information relevant to this survey:

Corrections to Echo Soundings Report OPR-R184-RA-85 (Filed with the Field
Electronic Control Report OPR-R184-RA-85 Records, H-10190)
Horizontal Control Report OPR-R184-RA-85
Coast Pilot Report OPR-R184-RA-85

Respectfully submitted,

John S. Griffin
John S. Griffin, ENS, NOAA


APPROVAL SHEET
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY

RA 20-4-85

H-10190

In producing this sheet, standard procedures were observed in accordance with the Hydrographic Manual, PMC OPORDERS, and Hydrographic Survey Guidelines. The data were examined daily during the execution of the survey.

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


for John P. Vandermeulen
Captain, NOAA
Commanding Officer

MASTER STATION LISTING
OPR-R184-RA-85.TOGIAK BAY. AK

VERSION FINAL

100	3	58	38	22048	160	16	08578	254	0092	329647	
/CROOKED 1948 AZ MK ECC (RED RAYDIST) PRELIM G.P											
101	3	58	37	40676	159	14	47361	250	0053	329647	
/PENINSULA 1947 AZ MK(GREEN RAYDIST) PRELIM G.P											
102	3	58	38	22048	160	16	08578	254	0081	000000	
/CROOKED 1948 AZ MK ECC (M/R) PRELIM G.P											
103	3	58	37	40676	159	14	47361	250	0042	000000	
/PENINSULA 1947 AZ MK (M/R) PRELIM G.P											
104	3	58	36	19285	159	58	33257	250	0430	000000	
/ROUND 1948 PRELIM G.P											
105	3	58	39	35290	160	15	14561	250	0127	000000	
/BOOB00 RAINIER G.P											
200	3	58	42	10704	160	17	18642	139	0050	000000	
/CROOKED 1948 PRELIM G.P											
201	3	58	50	49897	160	13	15720	139	0151	000000	
/SUMMIT 1948 AZ MK 581601											
202	3	58	38	21908	160	16	08412	250	0050	000000	
/CROOKED 1948 AZ MK PRELIM G.P											

FIELD TIDE NOTE
RA-20-4-85
H-10190

Field tide reduction of soundings was based on predicted tides from Nushagak Bay, Alaska. Corrections were applied from Black Rock, Walrus Islands, Bristol Bay, Alaska. Black Rock predicted correctors are as follows:

TIME		HEIGHT	
<u>high</u>	<u>low</u>	<u>high</u>	<u>low</u>
+7 min	-7 min	-10.2	.70 (ratio)

The predicted tides were derived using program AM500.
All times of both predicted and recorded tides are UTC.

Bristol Bubbler tide gages were installed at four locations in the project area. At three of these locations backup gages were installed. 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	- 6/8/85.
Gage Type	- Two 0-30 scale Bristol Bubblers, primary S/N 63A 2920 and backup S/N 67A 16205.
Level and 3 hr Obs	- 6/10/85.
Bench Marks	- Three recovered (BM No. 1 1948, No. 2 1948, No. 3 1948). Two set (BMs 5182 A 1985, 5182 B 1985).
Gage/Water	- Primary = 19.3 ft (from BM 5182 A) - Backup = 20.1 ft.
Removal Date	- 8/24/85
Marigram Records	- Primary (6/10/85 - 8/24/85) lost 5 days of records from 7/5/85 @ 1930 UTC through 7/10/85 at 2030 UTC when the marigram paper ran out. Primary gage lost 7 days from 7/10/85 - 7/17/85 when the marigram paper jumped sprockets. - Backup (6/27/85 - 8/24/85)

On 6/26/85 it was discovered that the staff was destroyed and the orifice tubing on the backup gage (S/N 63A 2920) had separated. A second staff was installed and divers repaired the orifice tubing. The new staff was leveled to three benchmarks and three hour observations were done on both gages.

On 7/23/85 it was discovered that the second staff was destroyed. Both gages were still operating. A third staff was installed and on 7/31/85 was leveled to three benchmarks. A 1 hr observation was done on both gages.

On 8/11/85 it was discovered that the third staff was destroyed. Both gages were still operating. Levels were run to the waters edge for the remainder of the project.

The levels run on 8/22/85 to the waters edge suggested that the backup gage orifice may have moved during the period 8/14 - 8/22. The marigram during that period shows heavy storm action and the orifice may have moved to a position approximately 1 foot shallower. Final levels on 8/24/85 confirmed this difference.

KULUKAK POINT (946-5265)

Geographic Locale	- Kulukak Point, AK. 58-50.4 N, 159-38.8W
Installation Date	- 6/11/85
Gage Type	- Bristol Bubbler 0-30 ft scale, S/N 64A 11028.
Level and 3 hr Obs	- 6/12/85
Bench Marks	- Set 5 (BM's 5265 A 1985, 5265 B 1985, 5265 C 1985, 5265 D 1985, 5265 E 1985).
Gage/Staff	- 16.1 ft
Removal Date	- 8/24/85
Marigram Records	- Uninterrupted records 6/12/85 - 8/7/85

On 6/25/85 it was discovered that 5 ft of the staff had broken off below the bottom bolt. The staff was secure and observations could still be made at low water by taping the distance to the water level from the lowest staff graduation.

Because of severe weather in the area this gage was not checked during August. On 8/24/85 the gage was removed. The staff was missing and the orifice tubing was broken. Final levels could not be run to the waters edge since the gage was not operating. Levels were run to the benchmarks only.

HAGEMEISTER ISLAND (946-5089)

Geographic Locale - South end, Hagemeister Island, AK.
58-33.4 N, 160-57.0 W.
Installation Date - Gage 6/21/85.
- Staff 6/28/85.
Gage Type - Two 0-30 ft scale Bristol Bubblers
Primary S/N 64A 11042, Backup S/N 67A
16209.
Level and 3 hr Obs - 6/29/85.
Bench Marks - Set 5 (BM's 5089 A 1985, 5089 B 1985,
5089 C 1985, 5089 D 1985, 5089 E 1985)
Gage/Staff - Primary 9.4 ft
- Backup 9.1 ft.
Removal Date - 8/23/85
Marigram Records - Primary (6/29/85 - 8/14/85) bad
records from 7/24/85 - 8/13/85 when
marigram paper jumped sprockets. Lost
records from 8/6/85 - 8/13/85.
- Backup (6/29/85 - 8/14/85) lost 4 days
from 7/20/85 - 7/24/85 when the gage
timer drive gear disengaged. Lost
records from 7/26/85 - 8/1/85 when
marigram paper jammed. Lost
records from 8/6/85 - 8/13/85.

In this location very strong currents and tidal surges were observed. The marigrams show these anomalies and combined with heavy surf in the area caused some difficulty in obtaining good staff/gage comparisons.

On 8/13/85 it was discovered that the tide station was completely destroyed. Gages, orifices, and staff were not found. New gage S/N 73A-231 was installed on this date. Levels were run to the waters edge and a 2 hour observation was performed. The gage/water constant (from BM 5089 C) = 12.6 ft. This gage ran for 13 hours before the tubing was broken by a severe storm. Final levels were run to benchmarks only.

NUSHAGAK PENINSULA (946-4961)

Geographic locale - Southwest side Nushagak Peninsula, AK
58/31.4 N, 159/09.2 W
Installation date - 6/24/85
Gage type - Two 0-30 ft Bristol Bubblers
Primary S/N 67A 10294
Backup S/N 68A 14940
Level and 3 hr Obs - 6/27/85
Bench Marks - Set 5 rod marks 6 ft into ground (BM's
4961 A 1985, 4961 B 1985, 4961 C 1985,
4961 D 1985, 4961 E 1985)
Gage/Water - Primary = 20.3 ft (from BM 4961 A)
- Backup = 25.4 ft
Removal Date - 8/24/85
Mariogram records - Primary (6/27/85 - 8/7/85) lost 8 days
from 7/24/85 - 7/31/85 when the
mariogram paper jammed.
- Backup (6/27/85 - 8/7/85)

Because of high surf conditions and an unremarkable shoreline a tide staff could not be installed, therefore, levels were run to the waters edge. During the 3 hr observation the backup gage mariogram had to be re-zeroed to ensure recording of minus tides. Three feet were added to the backup gage trace. The second half of the observation reflects the resetting of the trace.

On 6/27/85 it was discovered that the tubing had parted from the orifice on the backup gage (S/N 68A 14940). Divers repaired and secured the orifice tubing.

Scanning the mariogram for the primary gage from 7/17/85 - 7/24/85 revealed that the orifice was clogged with sand. On 7/31/85 divers were sent to investigate this problem and it was discovered that the orifice tubing had recently ruptured. The tubing was repaired and the sand was cleared from the orifice and tubing.

On 8/11/85 both gages were found to be inoperative. The orifice tubing was broken and the orifices were covered by two feet of sand and could not be recovered. Due to weather conditions these gages were not re-installed.

LEVELS

The control station at Unalaska was leveled June 15, 1985. Final levels were run August 16, 1985. No problems were encountered with this station.

Final levels on the subordinate stations compared very well.

GAGES

Field comparisons were made using marigram data from each tide station and a predicted tide curve for Black Rock.

Based on Black Rock Predicted:

<u>GAGE</u>	<u>TIME CORR.</u>	<u>RANGE RATIO</u>
Black Rock	-30 min	1.1
Kulukak	-45 min	1.2
Nushagak	-70 min	1.2
Hagemeister	+60 min	0.7

These approximate values are based on a sample of five days taken during the period of the survey.

ZONING

It should be noted that the predicted tides supplied in the project instructions proved to be inadequate. Preliminary plots showed disagreements up to 2 fathoms in some areas of crosslines and splits. Predicted tides off Black Rock provided better agreement in these areas minimizing disagreements to 1 fathom. The Tides and Water Level Branch in Rockville will supply smooth tide correctors for this survey.

MISCELLANEOUS

At all four tide station locations the gages were exposed to open water and heavy surf conditions. Many times they were impossible to tend and went for extended periods without being checked.

On three occasions the gages were not tended because of weather conditions and hydro was run while these gages were not operating. On 8/13/85 hydro was run while Kulukak and Nushagak gages were down. On 8/22/85 and 8/23/85 hydro was run while Kulukak, Nushagak, and Hagemeister gages were down.

In scanning the marigrams which had jumped sprocket holes special methods were needed to obtain accurate hourly heights. The large time errors were distributed linearly and heights had to be corrected by the amount that the sprockets missed the guide holes in the marigram paper.

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

SUPERSEDED
6/7/91

DATE: 12/20/85

Marine Center: Pacific

OPR: R-184

Hydrographic Sheet: H-10190

Locality: 20 miles south of Crooked Island, Bristol Bay, AK

Time Period: August 5 - 27, 1985

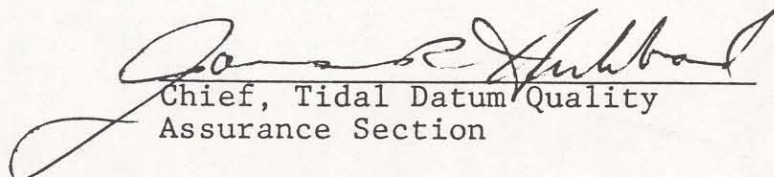
Tide Station Used: 946-5182 Black Rock, AK

Plane of Reference (Mean Lower Low Water): 20.29 ft.

Height of Mean High Water Above Plane of Reference: 9.0 ft.

Remarks: Recommended Zoning:

- 1) east of longitude $160^{\circ}12.0'$ apply -60 minute time correction and apply x0.92 range ratio to all heights
- 2) west of longitude $160^{\circ}12.0'$ apply -80 minute time correction to all heights


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-10190 (REVISED)

LOCALITY: 20 Miles South of Crooked Island, Bristol Bay, Alaska

TIME PERIOD: August 5 - 27, 1985

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

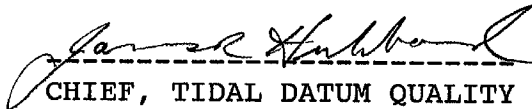
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 20.29 ft.

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

REMARKS: RECOMMENDED ZONING

Apply a +15 min. time correction and a x0.80 range ratio to
Black Rock (946-5182).

Note: Times are tabulated in Greenwich Mean Time.


CHIEF, TIDAL DATUM QUALITY
ASSURANCE SECTION

GEOGRAPHIC NAMES

H-10190

Name on Survey	<div style="display: flex; justify-content: space-between;"> <div style="transform: rotate(-45deg); white-space: nowrap;"> A ON CHART NO. 16315 2nd Edition B ON PREVIOUS SURVEY NO. </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> C ON U.S. QUADRANGLE MAPS </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> D FROM LOCAL INFORMATION </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> E ON LOCAL MAPS </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> F P.O. GUIDE OR MAP </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> G RAND McNALLY ATLAS </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> H U.S. LIGHT LIST </div> <div style="transform: rotate(-45deg); white-space: nowrap;"> K </div> </div>										
	Alaska	X									
Bristol Bay	X										2
Crooked Island	X										3
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NOAA FORM 77-27(H) (9-83)		U.S. DEPARTMENT OF COMMERCE		REGISTRY NUMBER H-10190	
HYDROGRAPHIC SURVEY STATISTICS					
RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed.					
RECORD DESCRIPTION		AMOUNT		RECORD DESCRIPTION	
SMOOTH SHEET		1 + 1		SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT		1		FIELD SHEETS AND OTHER OVERLAYS	
DESCRIPTIVE REPORT				2	
DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDION FILES					
ENVELOPES					
VOLUMES	1				
CAHIERS	2				
BOXES					
SHORELINE DATA					
SHORELINE MAPS (List):					
PHOTOBATHYMETRIC MAPS (List):					
NOTES TO THE HYDROGRAPHER (List):					
SPECIAL REPORTS (List):					
NAUTICAL CHARTS (List):					
OFFICE PROCESSING ACTIVITIES The following statistics will be submitted with the cartographer's report on the survey					
PROCESSING ACTIVITY			AMOUNTS		
			VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET					2226
POSITIONS REVISED					3836
SOUNDINGS REVISED					86
CONTROL STATIONS REVISED					
			TIME-HOURS		
			VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION					
VERIFICATION OF CONTROL					
VERIFICATION OF POSITIONS			5		5
VERIFICATION OF SOUNDINGS			76.5		76.5
VERIFICATION OF JUNCTIONS					
APPLICATION OF PHOTOBATHYMETRY					
SHORELINE APPLICATION/VERIFICATION					
COMPILATION OF SMOOTH SHEET			14		14
COMPARISON WITH PRIOR SURVEYS AND CHARTS				5	5
EVALUATION OF SIDE SCAN SONAR RECORDS					
EVALUATION OF WIRE DRAGS AND SWEEPS					
EVALUATION REPORT				15	
GEOGRAPHIC NAMES					
OTHER* Digitizing					5
*USE OTHER SIDE OF FORM FOR REMARKS			TOTALS	95.5	20
					120.5
Pre-processing Examination by J.L. Stringham			Beginning Date 10/18/85	Ending Date 10/18/85	
Verification of Field Data by J.N. Shofner, J.L. Stringham			Time (Hours) 95.5	Ending Date 5/15/86	
Verification Check by B.A. Olmstead, J.L. Stringham, J.S. Green			Time (Hours) 26	Ending Date 6/2/86	
Evaluation and Analysis by Gordon E. Kay			Time (Hours) 20	Ending Date 6/2/86	
Inspection by D. Hill			Time (Hours) 2	Ending Date 6/2/86	

PACIFIC MARINE CENTER
EVALUATION REPORT
H-10190

1. INTRODUCTION

H-10190 was accomplished by NOAA Ship RAINIER in accordance with the following project instructions:

OPR-R184-RA-85, Togiak Bay, Alaska, dated April 30, 1985

This is a basic survey of an area 20 miles south of Crooked Island, in the northern portion of Bristol Bay, Alaska. The offshore limit of this survey is latitude 58°13'30"N where 19-fathom depths can be found. The northern limit of the survey near Crooked Island at latitude 58°22'00"N is an area of decreasing depths. Survey depths of 6.0 fathoms can be found in this area. The eastern limit of the survey is longitude 160°12'00"W and the western limit is longitude 160°27'00"W. Bottom characteristics are typically sand and broken shells.

Predicted tides used during field processing were based upon Nushagak Bay, Alaska, reference station with corrections applied from Black Rock, Alaska. Tide correctors used for the reduction of final soundings reflect approved hourly heights zoned from Black Rock, Alaska (946-5182).

The field sheet parameters have been revised to center the hydrography on the smooth sheet and to change the projection to polyconic. An antenna distance correction of 32.2 meters has been applied to the position data during office processing. The revised data is listed in the smooth position and sounding printouts.

A digital file for this survey has been generated and includes categories of information required to comply with N/CG2 Hydrographic Survey Guideline No. 23, Completion of Digital Hydrographic Surveys, dated 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-85.

Horizontal control stations positions used during hydrography are either published or field positions based on the North American Datum of 1927.

There is no shoreline within the limits of this survey.

3. HYDROGRAPHY

Soundings at line crossings are in reasonably good agreement. Some differences in crossing values exist throughout the survey area. These differences of as much as 0.5 fathom are probably related to the difficulty in determining consistent tide reduction values. There is no evidence that differences are attributable to equipment or data processing deficiencies. In all cases, crossing agreement is in conformance with NOS specifications. The depth curves could be completely and adequately drawn. Delineation of the bottom configuration and the determination of least depths are adequate.

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 Three, except as noted in the Preprocessing Examination Report, dated October 15, 1985.

5. JUNCTIONS

H-10190 junctions to the east with H-10184 (1985) 1:20,000. The junction has been adequately effected.

There are no contemporary surveys to the west, north or to the south. A comparison with charted depths reveals a poor agreement with the present survey. Differences of up to 9 fathoms are evident. The shoaler charted depths are attributed to positional inaccuracies of the miscellaneous source data.

6. COMPARISON WITH PRIOR SURVEYS

H-7718 (1948) 1:100,000 - This prior survey covers the northern portion of the present survey from latitude 58°20'00"N. Survey data compares well with this prior survey. Present depths are less than 1/2 fathom shoaler or deeper than this prior, indicating a very stable bottom.

South of 58°20'00"N there are no prior surveys.

There are no AWOIS items originating from prior survey within the limits of this survey.

H-10190 is adequate to supersede the prior survey within the common area.

7. COMPARISON WITH CHART

a. Hydrography

Chart 16011, 30th Edition, dated April 2, 1983; scale 1:1,028,188

Most charted information originates from the prior survey discussed in section 6 of this report. Other soundings on Chart 16011 originate from

miscellaneous sources. For additional information see section L of the hydrographer's report.

Chart 16315, Provisional Chart 1st Edition, dated March 9, 1985;
scale 1:100,000

Chart 16315, Preliminary Chart 2nd Edition, dated January 4, 1986;
scale 1:100,000

This chart overlaps the survey north of latitude 58°20'00"N. Soundings on Chart 16315, 1st Edition originate from the prior survey H-7718 and unknown sources. This early data has been superseded on the 2nd Edition by unverified data from the H-10190 field sheet. The present survey should supersede hydrography within common areas on Chart 16315 and Chart 16011.

There are no AWOIS items originating from miscellaneous sources within the limits of this survey.

Geographic names appearing on the smooth sheet originate with Chart 16315.

There have been no dangers to navigation identified or reports submitted by the hydrographer or PMC Nautical Chart Branch.

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

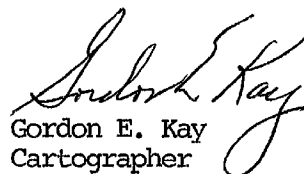
c. Aids to Navigation - There are no fixed or floating aids within the limits of this survey.

8. COMPLIANCE WITH INSTRUCTIONS

H-10190 adequately complies with the project instructions noted in section 1 of this report.

9. ADDITIONAL FIELD WORK

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


Gordon E. Kay
Cartographer

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


Dennis Hill
Chief, Hydrographic Section

ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10190


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.

 6-16-86
Chief, Nautical Chart Branch (Date)

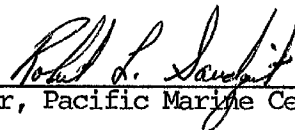
CLEARANCE:

SIGNATURE AND DATE:

N/MOP2:LWMordock

 6-16-86

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.

 6-16-86
Director, Pacific Marine Center (Date)

ADDENDUM
H-10190

Survey H-10190 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

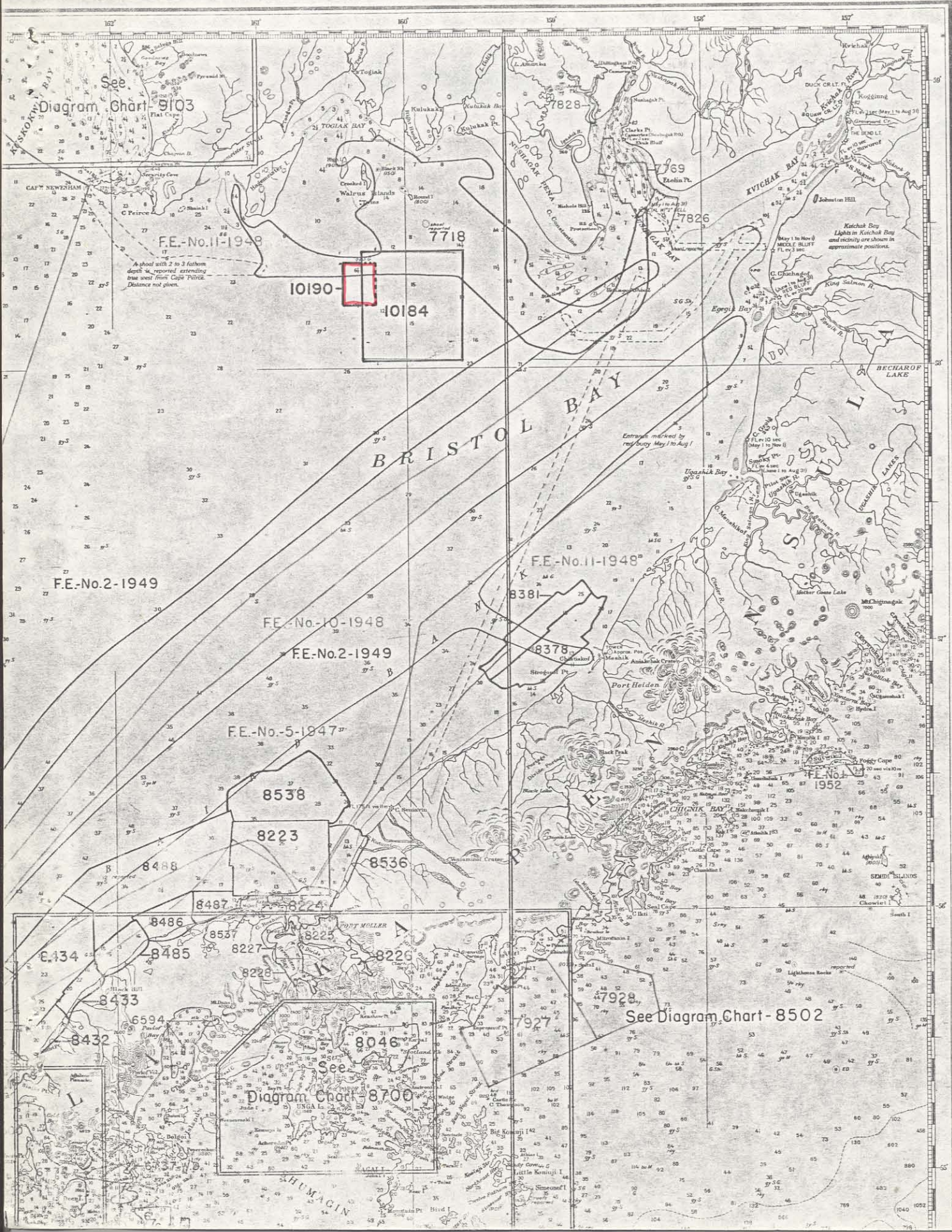
I have reviewed the smooth sheet revision overlay and accompanying data. This overlay and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting.

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



FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10190

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.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.