

H-10121

Diagram No. 8102-3

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-10-6-83
Office No..... H-10121

LOCALITY

State Alaska
General Locality Behm Canal
Locality Convenient Cove & Vicinity

1983

CHIEF OF PARTY
LCDR D.W. Yeager

LIBRARY & ARCHIVES

DATE November 26, 1984

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

Area 6

Chts

17422

17420

17360-nc

17385-nc

16016-nc

} for sign-off see
Record of Application

HYDROGRAPHIC TITLE SHEET

H-10121

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-10-6-83

State Alaska

General locality Behm Canal

Locality Convenient Cove and Vicinity

Scale 1:10,000 Date of survey November 3-18, 1983

Instructions dated September 8, 1983 Project No. OPR-0168-RA-83

Vessel NOAA Ship RAINIER and Launches

Chief of party David W. Yeager, LCDR, NOAA

Surveyed by LT S. Iwamoto, LT S. Ludwig, ENS R. Koehler, ENS B. Postle, ENS W. Logue, ENS K. Barton

Soundings taken by echo sounder, ~~and lead, etc.~~ Ross Fineline Fathometer Systems

Graphic record ~~skated~~ scanned by RAINIER personnel

Graphic record checked by RAINIER personnel

Verification by R. A. Shipley Automated plot by PMC Xynetics Plotter

Evaluation by C. R. Davies

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

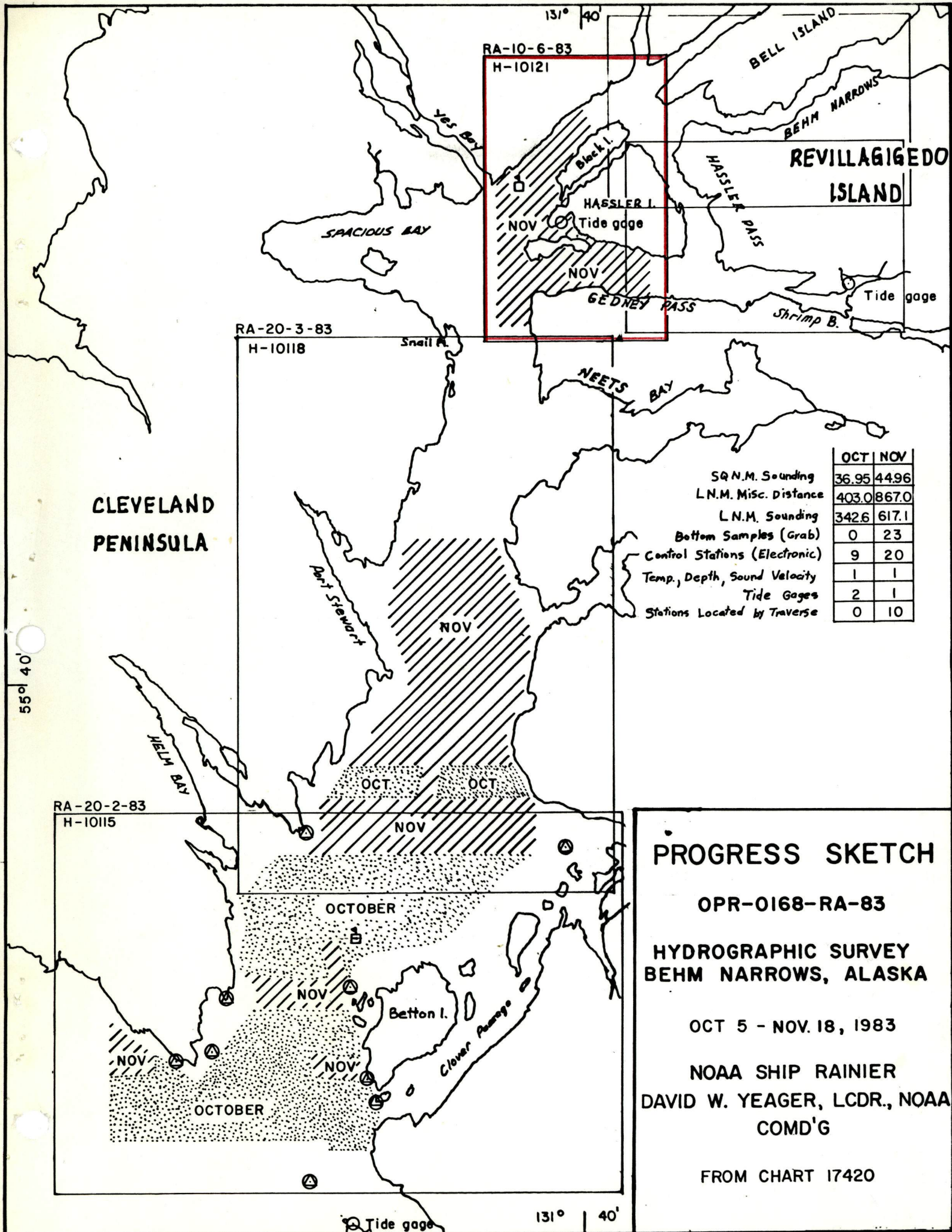
REMARKS: All times are in UTC. Revisions and marginal notes in black are by the Evaluator. Depths reported by the hydrographer have been revised to reflect the application of approved tides.

STANDARDS CK 11-29-84

C. Log

Awois and Surf - RWD 4/1/85

SA 4-15-97



RA-10-6-83
H-10121

RA-20-3-83
H-10118

RA-20-2-83
H-10115

	OCT	NOV
SQ.N.M. Sounding	36.95	44.96
LN.M. Misc. Distance	403.0	867.0
LN.M. Sounding	342.6	617.1
Bottom Samples (Grab)	0	23
Control Stations (Electronic)	9	20
Temp., Depth, Sound Velocity	1	1
Tide Gages	2	1
Stations Located by Traverse	0	10

PROGRESS SKETCH
OPR-0168-RA-83
HYDROGRAPHIC SURVEY
BEHM NARROWS, ALASKA

OCT 5 - NOV. 18, 1983

NOAA SHIP RAINIER
DAVID W. YEAGER, LCDR., NOAA
COMD'G

FROM CHART 17420

Tide gage

131° 40'

55° 40'

A. PROJECT ✓

Basic hydrographic survey H-10121 (RA-10-6-83) was conducted in accordance with Project Instructions OPR-0168-RA-83, Behm Narrows, Alaska dated September 8, 1983, Change No. 1, dated September ~~22~~⁸, 1983, and Change No. 2, dated November ~~10~~³, 1983.

B. AREA SURVEYED ✓

The section of Behm Canal and Gedney Pass surveyed, extends from 55°55'15"N to 55°49'30"N and from 131°44'00"W to 131°36'45"W. Dates of this survey were JD 307 to JD 322, November 3 - November 18.

C. SOUNDING VESSELS ✓

All soundings were obtained using the following hydrographic survey launches: RA-3 (2123), RA-4 (2124), RA-5 (2125), and RA-6 (2126). The RAINIER (2120) was used for all bottom sampling. No unusual sounding vessel configurations were utilized.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS ✓

Echo soundings obtained during survey H-10121 were taken by RAINIER survey launches equipped with Ross Fineline Fathometer systems. These systems include the following Ross components: Model 4000 transceivers, Model 5000 analog trace recorders, Model 6000 digitizers and 100 khz transducers. The serial numbers of these components are summarized in Table I.

TABLE I

Echo Sounding Component Serial Numbers

<u>Launch</u>	<u>2123</u>	<u>2124</u>	<u>2125</u>	<u>2126</u>
Transceiver	1041	1080	1042	1040
Analog	1042	1040	1070	1070
Digitizer	1041	1040	1042	1080

Analog recorder #1070 was interchanged between RA-5 and RA-6.

An STD cast was performed on November 15, 1983 at 55°53.2'N and 131°-42.8'W using a model No. 9040 (S/N 5652) STD. The STD was last calibrated in May 1983.

The data obtained by this cast was used to determine the preliminary velocity correctors for this survey. Copies of the graphs, the Velocity Table and a listing of the Velocity Tape are provided in the separates following the text. Both smooth field sheets were plotted using these velocity correctors.

Bar checks were taken on a daily basis. The TRA value for all launches was 0.3 fathoms. A listing of the TC/TI tape is provided in the separates following the text.

Settlement and squat tests were conducted on the survey launches on February 14, 1983 at Shilshole Bay, Puget Sound, Washington. All soundings were obtained at speeds for which the corrections are zero.

During survey operations, the blanking depth was set to a value shoaler than the shoalest bottom expected and was adjusted as the depth changed. Analog depths were substituted for missing or erroneous digital soundings as a part of standard scanning procedures.

The initial trace on the analog recorders was maintained at zero. Corrections for variation of the initial were applied during scanning.

Phase calibrations and belt tension checks were performed in accordance with section 4.9.6 of the Hydrographic Manual, Hydrographic Survey Guidelines and PMC OORDER, Appendix B.

For more information concerning corrections to echo soundings, refer to Echo Sounding Report, OPR -0168-RA-83.

E. HYDROGRAPHIC SHEETS ✓

Field sheets RA-10-6S-83 and RA-10-6N-83 were prepared on RAINIER using the PDP 8/e Hydroplot system which produces modified transverse Mercator projection. A list of parameters used to define each field sheet is provided in the separates following the text. *See ERM Report Section 1*

All data and accompanying field records will be sent to Pacific Marine Center, Seattle, Washington for verification.

F. CONTROL STATIONS ✓

Stations PATTY (138) and SEA (140) were established during this survey to Third-Order, Class I specifications. All other horizontal control stations used for this survey were existing Third Order, Class I (or better) stations on the North American 1927 Datum. (See Horizontal Control Report OPR-0168-RA-83).

G. HYDROGRAPHIC POSITION CONTROL ✓

Range/Range and Range-Azimuth were the methods used for hydrographic position control. The tables below summarize the location of all Mini-Ranger mobile and shore equipment.

TABLE II

Mini-Ranger Mobile Equipment

<u>Vessel</u>	<u>Console</u>	<u>R/T</u>
2123	720	2710
2124	715	B1108
2125	711	1646
2126	711	1646

TABLE III

Mini-Ranger Shore Equipment

<u>Code</u>	<u>Transponder S/N</u>	<u>Station #</u>
B	4951	124,125,127,131,138
C	1628	124,125,126
D	1569	122,124,127
E	911721	125,138,140
1	C1883	135
2	B1106	123,204

Initial Mini-Ranger baseline calibration for this project was conducted on Lake Union, Seattle, Washington on September 2 and 13, 1983. Ending baseline calibrations were conducted in the same area on December 2, 1983. Only initial correctors were used to plot the smooth field sheet. The initial baseline calibration for each R/T console pair and transponder combination also determined minimum signal strength cutoff values for each system. Daily systems checks were performed to confirm the baseline correctors. For more information concerning initial and ending calibrations, refer to Electronic Control Report OPR-0168-RA-83.

H. SHORELINE ✓

The shoreline for this survey was transferred from a 1:10,000 scale enlargement of Map TP-01159, 1:20,000. No field edit was conducted. Changes to the shoreline are shown in red on the smooth field sheet.
No shoreline in red on the final field sheet.

*See EVAC Report
Section 2 and 4*

An uncovered rock on the map at $55^{\circ}51'34''N$, $131^{\circ}38'48''W$ was disproved by a low water visual inspection on J.D. 311, Position 6138. *concur*

A rock, which uncovers 9 ft. at predicted MLLW, and not shown on the map was located on J.D. 321, Position 6688 at $55^{\circ}52'52''N$, $131^{\circ}41'03''W$. This rock is correct on Chart 17422 and appears on prior survey H-5103.
The rock uncovers 10ft with ebb tides.

I. CROSSLINES ✓

Crossline comparisons were good, with all soundings except three, agreeing to within 1 fathom. The table below identifies the three discrepancies.

<u>Position No.</u>	<u>J.D.</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Difference</u>
3370 +1 out	320	55 53 15	131 42 18	3 fm
3505 +1 out	321	55 53 15	131 42 18	
4063 +5 out	320	55 54 30	131 40 22	17 fm
4035 +3 out	321	55 54 30	131 40 22	
3149 +5 & +6 out	309	55 50 50	131 43 30	5 fm
3020 +4 out	307	55 50 50	131 43 30	

These discrepancies occur where the bottom has a steep gradient. Hence, a small difference in horizontal distance or transducer angle yields a relatively large difference in depth.

J. JUNCTIONS ✓

This survey does not junction with any contemporary survey.

K. COMPARISONS WITH PRIOR SURVEYS ✓

The present survey was compared to surveys H-5103, H-5105 and H-5106 (1930). The prior surveys were 1:20,000 scale. Comparison of soundings showed good agreement in shoal areas. Discrepancies of up to 7 fathoms can be seen in the deepest areas of Gedney Pass.

*See Eux Report
Section 6*

A ~~charted~~ ¹⁹ 9½ fathom sounding from H-5105 at 55°50'28"N, 131°39'46"W, should be superceded. This location was found to be 20 fathoms and an area of steep gradient. *Chart according to smooth sheet.*

Concur

A charted 26 fathom sounding from H-5105 at 55°50'12"N, 131°37'04"W, should be superceded. This location was found to be 40 fathoms and an area of steep gradient. *Chart according to smooth sheet*

33

¹⁹ 20 fm and 19 fm soundings were discovered at 55°51'16.5"N, 131°38'08"W and at 55°51'27.5"N, 131°38'51"W, respectively. Neither sounding is a danger to navigation. However, both soundings are more representative of shoaler depths when compared with prior survey H-5105. Hence, the next chart edition should show these soundings. *Chart according to Smooth Sheet*

Concur

PSR item #50587 was inspected on J.D. 321 (fix #6653, 6654, 6714, and 6715). The first two detached positions were done several hours before low water. Three hours later, two more definitive detached positions were obtained on the same rocks. These two D.P.'s were the shoalest peaks of the rock ledge as shown on map TP-00159. This ledge should be charted instead of the individual rocks from prior survey H-5103. *concur*
Positions 6653 and 6654 were rejected, duplication of data. Chart according to smooth sheet.

L. COMPARISON WITH THE CHART ✓ ** (8) shown on smooth sheet in lat 55-52-45.36N, Long. 131-41-06.87W. Pos 6714.*

Comparisons were made with a 1:10,000 enlargement of chart 17422, 26th edition, August 15, 1981. Two shoal depths were found at the entrance to Blind Pass and are considered dangers to navigation. Correspondence with the Coast Guard is appended to this report. *See Encl Report Section 7*

A ^{2.8}~~3.0~~ fathom (MLLW) was found at 55°52'51^{.24}''N, 131°41'28^{.77}''W, Position 3449-50, J.D. 319. The charted depth is 4¹/₂ fathoms.

A ^{2.8}~~2.8~~ fathom (MLLW) was found at 55°52'42^{.70}''N, 131°41'20^{19 18.0}''W, Position 3336-7, J.D. 311. The charted depth is 4 fathoms. *2.6fm Found 40m. NE; 1.0 fm sndg. Found approx 100m. NE.*

Both of these soundings should be charted. Additional charting recommendations are contained in Section K.

M. ADEQUACY OF SURVEY ✓

Survey H-10121 is complete and adequate to supercede all prior surveys for charting.

N. AIDS TO NAVIGATION ✓

There is one fixed aid to navigation. Bluff Pt. Light, 1930 exists in the survey area at 55°53'04''N, 131°44'41''W. This light was positioned by Third-Order, Class I methods and form 76-40 is attached as a separate to this report.

O. STATISTICS

Launch	Linear/Nautical Miles of Hydrography	Square Miles	Positions
2120			8
2123	66.1	--	626 573
2124	30.1	--	248 236
2125	22.9	--	190 188
2126	80.6	--	797 759
TOTAL	199.7	9.2	1861 1764

Tide gages: 3
 STD cast 1
 Bottom Samples 8

P. MISCELLANEOUS ✓

No anomalous currents were observed or reported during this survey.

Q. RECOMMENDATIONS ✓

It is recommended that soundings from this survey supersede all other soundings for charting purposes.

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 OORDER, Hydrographic Survey Guidelines and the Hydrographic Data Requirements for 1983.

Soundings and positions were taken by an ASI Logger and a Hydroplot system using Range/Azimuth program FA 181 and Range/Range/Hyperbolic program RK 112. There are daily master tapes and corresponding corrector tapes which include the TRA for the launches, electronic control baseline correctors for Mini-Ranger consoles and R/T units and all depth corrections. Velocity tapes were generated from STD cast data. The following is a list of all computer programs and version dates used for data acquisition or processing:

<u>Number</u>	<u>Description</u>	<u>Version</u>
RK 112	Hyperbolic, R/R Hydroplot	8/04/81
FA 181	Range/Azimuth Hydrolog	2/23/78
RK 201	Grid, Signal, and Lattice Plot	4/18/75
RK 211	Range/Range Non-Real Time Plot	2/02/81
RK 212	Vision Station Table Load	4/01/74
RK 216	Range/Azimuth Non-Real Plot	2/09/81
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
AM 500	Predicted Tide Generator	11/10/72
RK 561	H/R Geodetic Calibration	12/01/82
AM 602	Elinore-Line Oriented Editor	12/08/82
AM 603	Tape Consolidator	10/10/72
RK 606	Tape Duplicator	8/22/74
AM 607	Self-Starting Binary Loader	8/10/80
RK 610	Binary Tape Duplicator	12/01/82

<u>Number</u>	<u>Description</u>	<u>Version</u>
RK 900	Plot Test Tape Generator For AM 902	5/07/76
PM 901	Core Check	3/01/72
AM 902	Real Time Checkout	11/10/72
DA 903	Diagnostic-Instruction Timer	2/27/76
RK 905	Hydroplot Controller Checkout	3/18/81
RK 935	Hydroplot Hardware Tests	3/15/82
RK 950	Hardware Tests (Documentation Only)	6/02/75
RALOGD	RA-6 Hydrologger	3/11/83

The HP97 and HP9815A programmable calculators were used to compute geographic positions of control stations and velocity of sound corrections for the plotting of the smooth field sheets.

S. REFERRAL TO REPORTS ✓

The following reports contain information related to this survey:

Echo Sounding Report	OPR-0168-RA-83
Electronic Control Report	OPR-0168-RA-83
Horizontal Control Report	OPR-0168-RA-83
Coast Pilot Report	OPR-0168-RA-83

Respectfully submitted,

W. G. Logue, Jr. for
 William G. Logue, Jr.
 ENS, NOAA



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship RAINIER S221
1801 Fairview Avenue East
Seattle, Washington 98102-3767

December 29, 1983

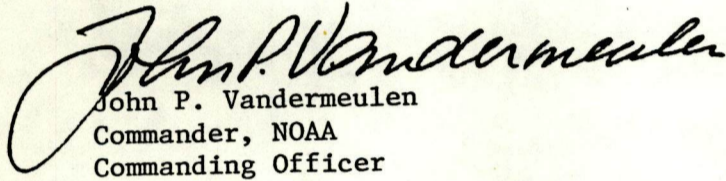
Commander
Seventeenth Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99803

Dear Sir:

The following dangers to navigation were determined by the NOAA Ship RAINIER during survey operations in Behm Canal, vicinity of Blind Pass, Alaska. These dangers to navigation are submitted for inclusion in the Local Notice to Mariners for Chart 17422, 6th Edition, August 15, 1981.

- 1) A least depth of 3.0 fathoms (predicted MLLW) was found at Latitude $55^{\circ}52'51.5''N$, Longitude $131^{\circ}41'28.0''W$, (H-10121). The present charted depth is $4\frac{1}{2}$ fathoms.
- 2) A least depth of 2.9 fathoms (predicted MLLW) was found at Latitude $55^{\circ}52'42''N$, Longitude $131^{\circ}41'20''W$, (H-10121). The present charted depth is 4 fathoms.

Sincerely,


John P. Vandermeulen
Commander, NOAA
Commanding Officer

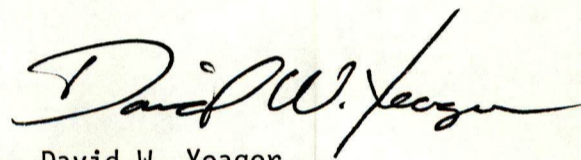
cc: MOP
N/CG222 - Rockville, MD



APPROVAL SHEET
DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
H-10121

In producing this sheet, standard procedures were observed in accordance with the Hydrographic Manual, PMC OPORDER, and the Instruction Manual for Automated Hydrographic Surveys. The data was examined daily during the execution of the survey.

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



David W. Yeager
Lieutenant Commander
Acting Commanding Officer

MASTER STATION LIST
 OPR-0168-RA-83
 BEHM NARROWS . ALASKA

FINAL VERSION

*	100	4	55	26	50583	132	06	46496	250	0002	000000	
	/APPROACH-GRINDALL 2 1915											
										551322	(1001)	
*	101	4	55	26	46678	131	52	45918	250	0002	000000	
	/GUARD ISLAND LIGHTHOUSE 1930											
										551313	(1078)	
*	102	4	55	28	06550	131	49	46244	139	0002	000000	
	/SURVEY 1930											
										551313	(1199)	
*	103	4	55	28	50870	131	49	40568	250	0003	000000	
	/PUP 1930											
										551313	(1156)	
*	104	4	55	29	28409	131	50	02383	250	0001	000000	
	/BET 1930											
										551313	(1016)	
*	105	4	55	30	12879	131	57	17148	250	0003	000000	
	/MAN 2 1929											
										551314	(1086)	
*	106	4	55	31	35700	131	56	32432	250	0002	000000	
	/BOND 1930											
										551314	(1011)	
*	107	4	55	30	59893	131	50	44752	139	0006	000000	
	/HEAD 1930											
										551314	(1056)	
*	108	4	55	31	33698	131	50	55664	250	0003	000000	
	/TATOOSH 2 1929											
										551314	(1146)	
*	109	4	55	29	55703	131	58	55329	250	0012	000000	
	/CAAMANO POINT LIGHT 1962											
										551313	(1027)	
*	110	4	55	29	55124	131	58	55186	250	0005	000000	
	/CAAMANO 1912											
										551313	(1028)	
*	111	4	55	33	45830	131	56	18068	139	0001	000000	
	/GUM 1930											
										551314	(1051)	
*	112	4	55	34	51666	131	55	38092	139	0003	000000	
	/MUG 1930											
										551314	(1093)	
*	113	4	55	36	17284	131	56	38409	139	0001	000000	
	/HELM 1930											
										551314	(1057)	
*	114	4	55	36	01880	131	53	42907	139	0001	000000	
	/MEL 1930											
										551314	(1087)	

* Not used for H-10121

* 115 4	55 35	58507	131 52	56150	250	0007	000000
/TRUNK 2 1929						551314(1154)	
* 116 4	55 32	25405	131 48	28265	250	0002	000000
/BETTON 1929						551314(1005)	
* 117 4	55 32	38654	131 45	13045	139	0001	000000
/BACK 1930						551314(1001)	
* 118 4	55 33	52461	131 43	02914	139	0001	000000
/GRANT 1930						NGS LISTING	
* 119 4	55 35	39000	131 40	53972	250	0001	000000
/CACHE 1930						NGS LISTING	
* 120 4	55 38	32396	131 43	18292	250	0002	000000
/PUG 2 1929						NGS LISTING	
* 121 4	55 40	17324	131 48	57527	250	0003	000000
/POY 1891						NGS LISTING	
122 6	55 52	50350	131 45	04582	250	0003	000000
/KISS 2 1929						NGS LISTING	
123 6	55 49	26761	131 46	02723	250	0003	000000
/COD 2 1929						NGS LISTING	
124 6	55 50	19992	131 42	02821	250	0001	000000
/BROW 1930						NGS LISTING	
125 6	55 50	12216	131 35	51175	250	0002	000000
/CON 1930						NGS LISTING	
126 0	55 51	24546	131 39	48629	250	0001	000000
/PROB 1930						NGS LISTING	
127 6	55 50	26513	131 39	27274	250	0002	000000
/NEY 1930						NGS LISTING	
128 6	55 52	43148	131 41	10272	250	0002	000000
/BLIND 1930						NGS LISTING	
* 129 4	55 55	42944	131 36	43589	250	0001	000000
/SNIP 1930						NGS LISTING	
* 130 3	55 55	48252	131 38	31675	250	0002	000000
/JOHN 1929						NGS LISTING	
131 0	55 51	10860	131 35	39329	250	0004	000000
/FIN 1930						NGS LISTING	

*	132 0	55 53	53817	131 42	50065	250	0003	000000	
	/BARN 1891							NGS LISTING	
*	133 0	55 54	10882	131 42	15873	250	0001	000000	
	/COST 2 1929							NGS LISTING	
	134 0	55 54	34238	131 41	33169	250	0002	000000	
	/CASEY 1929							NGS LISTING	
	135 0	55 55	20468	131 39	55440	250	0003	000000	
	/SIS 2 1929							NGS LISTING	
*	136 2	55 55	20167	131 36	30035	250	0001	000000	
	/FOR 2 1929							NGS LISTING	
*	137 0	55 54	25691	131 37	56338	250	0001	000000	
	/PASS 1930							NGS LISTING	
	138 6	55 51	46189	131 40	57742	250	0002	000000	
	/PATTY 1983							UNADJUSTED FIELD G.P.	
*	139 4	55 43	46076	131 43	49308	250	0005	000000	
	/GO 2 1929							NGS LISTING	
	140 3	55 52	55972	131 40	55744	250	0001	000000	
	/SEA 1983							UNADJUSTED FIELD G.P.	
*	141 3	55 53	06575	131 40	53759	139	0002	000000	
	/ADELE 1983							UNADJUSTED FIELD G.P.	
*	142 3	55 52	57215	131 40	46229	139	0001	000000	
	/MELISSA 1983							UNADJUSTED FIELD G.P.	
*	143 3	55 53	32800	131 39	45895	139	0001	000000	
	/IDA 1983							UNADJUSTED FIELD G.P.	
*	144 3	55 53	46488	131 38	50029	139	0001	000000	
	/TREP 1983							UNADJUSTED FIELD G.P.	
*	200 4	55 36	51787	131 41	54283	139	0001	000000	
	/DIN 1930							NGS LISTING	
*	201 4	55 43	53076	131 43	50218	139	0002	000000	
	/POKE 1891							NGS LISTING	
*	202 3	55 25	52992	131 51	40042	139	0002	000000	
	/VAL 2 1930							NGS LISTING	
*	203 3	55 24	04295	132 09	45028	139	0012	000000	
	/HIGH ISLAND LIGHT							NGS LISTING	

204 7 55 51 39951 131 42 41533 139 0002 000000
/LEE 1891 NGS LISTING

205 3 55 53 04189 131 44 40343 139 0003 000000
/BLUFF PT. LIGHT, 1983 UNADJUSTED FIELD G.P.

* 206 3 55 43 53106 131 43 50211 139 0007 000000
/BUSHY POINT LIGHT UNADJUSTED FIELD G.P.

* 207 3 55 33 17604 131 43 37736 139 0005 000000
/GRANT ISLAND LIGHT UNADJUSTED FIELD G.P.

* 208 3 55 34 51725 131 55 37362 139 0003 000000
/HELM BAY LIGHT UNADJUSTED FIELD G.P.

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	NAME	ORIGINATOR
OBJECTS INSPECTED FROM SEAWARD	Richard B. Koehler, LTJG., NOAA	<input type="checkbox"/> PHOTO FIELD PARTY <input checked="" type="checkbox"/> HYDROGRAPHIC PARTY <input type="checkbox"/> GEODETIC PARTY <input type="checkbox"/> OTHER (Specify)
POSITIONS DETERMINED AND/OR VERIFIED	Richard B. Koehler, LTJG., NOAA	FIELD ACTIVITY REPRESENTATIVE
		OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW ACTIVITIES		<input type="checkbox"/> REVIEWER <input type="checkbox"/> QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64,

OFFICE

I. OFFICE IDENTIFIED AND LOCATED OBJECTS

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

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

FIELD

I. NEW POSITION DETERMINED OR VERIFIED

Enter the applicable data by symbols as follows:

F - Field P - Photogrammetric

L - Located Vis - Visually

V - Verified

1 - Triangulation 5 - Field identified

2 - Traverse 6 - Theodolite

3 - Intersection 7 - Planetable

4 - Resection 8 - Sextant

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

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

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

FIELD (Cont'd)

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

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

II. TRIANGULATION STATION RECOVERED

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

EXAMPLE: Triang. Rec.
8-12-75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8-12-75

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

FIELD TIDE NOTE

H-10121

Field tide reduction of soundings for survey H-10121 was based on predicted tides from Ketchikan, Alaska (945-0460). Corrections were obtained from Preliminary Tidal Zoning OPR-0168-RA-83. The predicted tides were derived using program AM 500.

The reference station at Ketchikan was leveled at the beginning of survey operations on September 22, 1983. Three permanent benchmarks (including the primary mark) were connected to the ETG reading mark. Levels were run at the end of survey operations on November 14, 1983. Initial and final levels compared favorably.

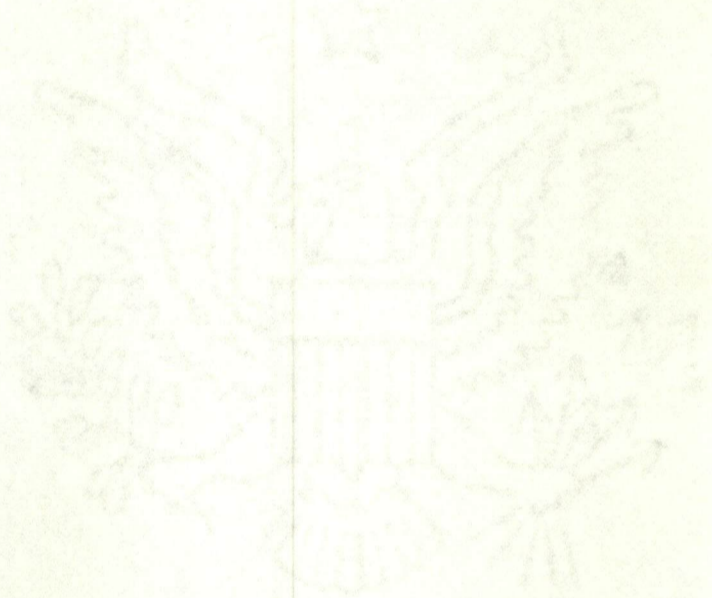
Three subordinate stations provided data for survey H-10121.

A bubbler tide gage was installed on October 19, 1983 in Convenient Cove (945-0807), $55^{\circ}52.08'N$, $131^{\circ}41.3'W$. Five permanent benchmarks were established and leveled on October 20, 1983. The staff value of the zero line on the analog tide record is +13.0 feet. The gage operated well throughout the period of hydrography. Final levels for this gage were run on November 18, 1983. Comparison of initial and final levels indicated that no significant movement of the staff occurred during the survey period.

The second bubbler tide gage was installed on October 21, 1983 at the historical site in Fitzgibbon Cove (945-0879), $55^{\circ}59'N$, $131^{\circ}10.5'W$. Three permanent benchmarks were recovered and two new benchmarks were established at this location. Initial levels were run on October 22, 1983. The staff value of the zero line on the analog tide record is +4.1 feet. The gage operated well throughout the time of hydrography. Final levels for this gage were run on November 18, 1983. Comparison of initial and final levels indicated that no significant movement of the staff occurred during the survey period.

The third bubbler tide gage was installed on November 2, 1983 at the historical site in Klu Bay (945-0791), $55^{\circ}50.54'N$, $131^{\circ}27.8'W$. Three permanent benchmarks were recovered at this location. BM 1 1930 was covered by water at all but low tides, therefore a temporary benchmark (RR spike) was used instead. Initial levels were run on November 5, 1983. The staff value of the zero line on the analog tide record is +12.9 feet. The first gage that was installed failed after one day of operation, creating a gap in the record of 7 hours. The replacement gage operated well throughout the remaining time of hydrography. Final levels for this gage were run on November 18, 1983. Comparison of initial and final levels indicated that no significant movement of the staff occurred during the survey period.

The time meridian used for records annotation at all sites was 0° (UTC).



1952

DATE: March 26, 1984 U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SHEET

Marine Center: Pacific

OPR: 0168

Hydrographic Sheet: H -10121

Locality: Behm Canal, Offshore Hassler Island, Alaska

Time Period: November 3 - 18, 1983

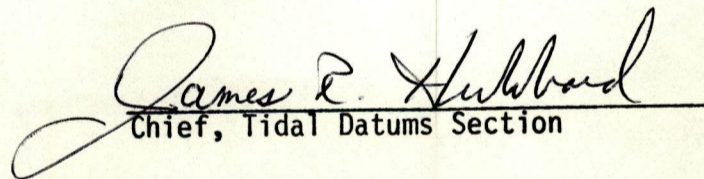
Tide Station Used: 945 0807 Convenient Cove, Alaska

Plane of Reference (Mean Lower Low Water): 18.56 Ft.

Height of Mean High Water Above Plane of Reference: 14.6 Ft.

Remarks: Recommended Zoning:

Zone Direct


Chief, Tidal Datums Section

HYDROGRAPHIC SURVEY STATISTICS

H-10121

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT		
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	7		
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	3		
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDIAN FILES	2			2	
ENVELOPES					
VOLUMES	1				
CAHIERS					
BOXES					

SHORELINE DATA

SHORELINE MAPS(List): TP-01159

PHOTOBATHYMETRIC MAPS(List):

NOTES TO THE HYDROGRAPHER(List):

SPECIAL REPORTS(List): Electronic Control Reports, Corrections to Echo Soundings Rpt.

NAUTICAL CHARTS(List): Blow-up chart 17422

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			1764
POSITIONS REVISED	40		40
SOUNDINGS REVISED Velocity change	7029		7029
CONTROL STATIONS REVISED			

TIME - HOURS

PROCESSING ACTIVITY	VERIFICATION	EVALUATION	TOTALS
	PRE-PROCESSING EXAMINATION		
VERIFICATION OF CONTROL	5	3	8
VERIFICATION OF POSITIONS	21	8	29
VERIFICATION OF SOUNDINGS	158	12	170
VERIFICATION OF JUNCTIONS	N/A	1	1
APPLICATION OF PHOTOBATHYMETRY	N/A		
SHORELINE APPLICATION/VERIFICATION	4	3	7
COMPILATION OF SMOOTH SHEET	33	7	40
COMPARISON WITH PRIOR SURVEYS AND CHARTS	4	7	11
EVALUATION OF SIDESCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT	4	11	15
OTHER			
Digitization	15		15
TOTALS	244	52	296

Activity	Beginning Date	Ending Date
Pre-processing Examination by J. Green, J. Stringham		
Verification of Field Data by Rick Shipley and Russ Davies	2-16-84	8/21/84
Velocity Change Check by J.L. Stringham, J.S. Green	10/11/84	10/23/84
Evaluation and Analysis by C.R. Davies	10/11/84	10/19/84
Inspection by D. Hill		11-1-84

PACIFIC MARINE CENTER
EVALUATION REPORT

REGISTRY NO: H-10121

FIELD NO: RA-10-6-83

Alaska, Behm Canal, Convenient Cove and Vicinity

SURVEYED: November 3-18, 1983

SCALE: 1:10,000

PROJECT NO: OPR-0168-RA-83

SOUNDINGS: Ross Fineline Fathometer

CONTROL: Range/Range
Range/Azimuth
Motorola Mini-Ranger III

Chief of Party.....Lt. Cdr. D. W. Yeager

Surveyed by.....Lt. S. Iwamoto
Lt. S. Ludwig
Ens. R. Koehler
Ens. B. Postle
Ens. W. Logue
Ens. K. Barton

Automated Plot by.....PMC Xynetics Plotter

Verified by.....R. A. Shipley

Evaluated by.....C. R. Davies

1. INTRODUCTION

H-10121 is a basic hydrographic survey conducted by the NOAA Ship RAINIER in accordance with the following:

Project Instructions for OPR-0168-RA-83, dated September 8, 1983
Change No. 1, dated September 8, 1983
Change No. 2, dated November 3, 1983

H-10121 is situated in the northern section of Behm Canal, Alaska. The survey extends two miles south of Brown Point on Revillagigedo Island to three miles north of the southern tip of Black Island. It also extends six miles east into Gedney Pass and west to the center of Behm Canal. The survey is centered on Convenient Cove.

Although H-10121 is a basic hydrographic survey with photogrammetric support, the high water line, high water features, and geographic names are not shown on the smooth sheet, in accordance with N/CG letter dated February 16, 1984, entitled "Reduction of Marine Center Hydrographic Survey Processing Backlog," copy attached.

Predicted tides based on the Ketchikan tide gage (945-0460) with time and range adjustments were utilized during shipboard processing. Tide correctors used for the reduction of the final soundings are computed from approved

hourly heights from one temporary bubbler-tide gage, Convenient Cove, see form 712.

Projection-parameters were changed to center the hydrography on the smooth sheet and to change the projection to polyconic.

Electronic correctors were revised to reflect the mean of baseline correctors applicable to the appropriate Mini-Ranger transponder unit.

TC/TI correctors were revised to reflect corrections made during processing. Whenever a rock height was inserted into the data a TRA value of zero was inserted.

Velocity correctors were changed to reflect a corrected velocity, see letter dated February 28, 1984, copy attached.

2. CONTROL AND SHORELINE

All horizontal control stations used for controlling hydrography were established in accordance with Third Order Class I or better geodetic standards. The smooth sheet was plotted using published NGS coordinates for existing stations and field geographic positions for newly established stations.

Hydrographic positioning was conducted using Motorola Mini-Ranger III configured in both range-range and range-azimuth modes. Baseline calibrations were performed before and after completing the project. Daily system checks to confirm the baseline values were conducted using sextant resection to signals over Second/Third Order stations.

All remaining information affecting the positioning and station control of this survey is listed in paragraphs F and G of the Descriptive Report, the Horizontal Control Report and the Electronic Control Report for OPR-0168-RA-83.

The applicable Class III shoreline manuscript and dates are as follows:

<u>Manuscript Number</u>	<u>Date of Photography</u>	<u>Date of Field Edit</u>
TP-01159	June 1982	None

The mean high water line was not shown on the smooth sheet. An islet originating from TP-01159 at latitude 55°53'6.65"N and longitude 131°41'11.28"W was verified by the field and is shown in red on the smooth sheet in order to portray the elevation data available from hydrographic records. All other foreshore/offshore features which are awash or uncovered at the sounding datum but are covered at mean high water were transferred to the survey.

3. HYDROGRAPHY

Crossline soundings are in good agreement. Generally, all standard depth curves are complete and satisfactory, except in areas that are foul and those with steeply sloping shorelines.

The bottom configuration and least depths were adequately determined with the exception of the following:

<u>Source Depths (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
7 ⁵	55°51'35"	131°42'50"
8 ⁷	55°53'09"	131°41'18"
6 ⁶	55°53'12.0"	131°41'15"

4. CONDITION OF SURVEY

The hydrographic records and reports are adequate and conform to the requirements of the Hydrographic Manual with the following exceptions:

- a. Several soundings warranted further development to locate the least depths (see section 3, Hydrography). The investigation of these features was incomplete (Hydrographic Manual, 4.3.4).
- b. The Descriptive Report did not accurately reflect the information shown on the final field sheet. In Section H, Shoreline, the hydrographer references red shoreline on the smooth field sheet. There was no red shoreline shown on the smooth field sheet.

5. JUNCTIONS

H-10121 is not bordered by any contemporary surveys. Depths on this survey are in harmony with charted depths in the junction areas.

6. COMPARISON WITH PRIOR SURVEYS

H-5103, 1:20,000 (1930)
 H-5105, 1:20,000 (1930)
 H-5106, 1:20,000 (1930)

The present survey compares fairly well with the prior surveys, generally shoaler from one to five fathoms over the area of common coverage. These differences are attributed to data acquisition and positioning techniques. The sounding density of present survey is much greater than that of the prior.

The present survey should supersede H-5103, 5105, 5106, over the area of common coverage.

7. COMPARISON WITH CHART

17422 26th Edition, August 26, 1981

- a. Hydrography -- Charted information originates with the prior surveys discussed previously. All charted features were satisfactorily disposed of and discussed in the Descriptive Report. Charted soundings along the shoreline have been displaced offshore for clarity.

There were two Dangers to Navigation found during survey operations. This information has been forwarded to the 17th USCG District via letter (copy attached).

The geographic names shown on the smooth sheet originate from this chart.

H-10121 is adequate to supersede charted hydrography within the common area.

b. Controlling depths -- There are no controlling depths within the limits of the survey.

c. Aids to Navigation -- There is one fixed aid within the limits of this survey. The aid adequately marks the feature intended.

8. COMPLIANCE WITH INSTRUCTIONS

H-10121 adequately complies with the project instructions and changes as amended and noted in section 1 of this report.

9. ADDITIONAL FIELD WORK

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

Respectfully submitted

Charles R. Davies

C. R. Davies
Cartographer
October 17, 1984

This survey has been verified and evaluated. I have examined this survey and it meets Charting and Geodetic Services survey standards and requirements for use in nautical charting except as noted in the Evaluation Report. This survey is recommended for approval.

James S. Green
James S. Green
Supervisory Cartographer



UNITED STATES
National Oceanic and
ATMOSPHERIC ADMINISTRATION
NATIONAL OCEANOGRAPHIC
CHARTING AND
ROCKVILLE, MARYLAND

AMERCE
istration

X1

10P2

4821

FEB 16 1984

TO: N/MO - Robert C. Munson

FROM: N/CG - John D. Bossler

SUBJECT: Reduction of Marine Center Hydrographic Survey Processing Backlog

Marine Center and Nautical Charting Division representatives met on January 30 and 31, 1984, to determine actions to be taken to reduce the Atlantic Marine Center (AMC) processing backlog specifically and reduce processing time in general. The following actions were agreed to and approved by the Chief, Nautical Charting Division:

OK

OK

?

OK

OK

1. AMC will forward all wire-drag surveys not in final stages of processing to Hydrographic Surveys Branch (HSB) for abstracting of information. Surveys in final stages will be completed by AMC. Surveys where obstructions were not found will not be processed immediately, unless the information is determined critical by HSB (these surveys will be processed completely at a later date).

2. Surveys for the Navy will be processed per the Memorandum of Agreement; i.e., replotting of the field sheets and adding smooth tide data. It is anticipated that approximately 60 to 80 hours will be spent on these surveys.

Marine Center

3. Digitizing of surveys after processing at the Marine Centers will be accomplished by Photogrammetry personnel. This procedure usually requires 24 hours per survey sheet. Personnel at both Marine Centers will be identified by the Marine Center Directors to accomplish this starting immediately. *Have Reservations About This - Accuracy Uncertain But Expect Accuracy's Not*

4. The requirement for transferring T-sheet (shoreline manuscript) data to the smooth sheet and field sheet will be relaxed. Anything that is on the T-sheet may be transferred to the field sheet by the hydrographer to help in planning or data acquisition. Copious notes on discrepancies must be made by the hydrographer to clearly indicate what was found and method used. Deletions are particularly important. The hydrographer must explain recommended deletions so that no question can come from his work, and it is apparent to the verifier as to what was done. *LT Henry Warren on Hydrology Fed Stan*

4.5. Shoreline and Geographic Names data on T-sheets shall not be duplicated on the smooth sheet. Freehand annotations on the smooth sheet are encouraged. Any further cartographic requirements that could be eliminated should be brought to the attention of the Program Manager (Chief, Nautical Charting Division) for action.



OK

5. The preprocessing effort at AMC will be assigned to one individual.

OK

6. A campaign to increase quality of data acquisition was initiated at both Marine Centers in command seminars and workshops. Every effort should be made to impress upon ships and field parties the importance of complete, orderly, documented data to the efficient processing of that data.

OK

7. Loran-C data will be handled such that it does not impact the normal processing flow of hydrographic data. The stripping off and merging process should be at any point that is most convenient for the processing cycle.

OK

8. To enable AMC to significantly reduce their inventory, a combination of reduced input of surveys and increased output is necessary in addition to the above seven steps.

OK

Assignment of the NOAA Ship MT. MITCHELL to other projects for 3 years will reduce the AMC input to 25 to 30 surveys a year. To increase the AMC output of surveys to 50 to 60 per year, six personnel will be added to processing, bringing the total to 15. Also, procedures to streamline the flow of data will be initiated.

It was determined that the first seven steps should reduce the inventory at the Pacific Marine Center to a normal work in progress level.

NEW
DEFINITION
*

At both Marine Centers, a normal work in progress level was determined to be approximately half the annual processing output. This number is necessary to keep every process in the system active.

Resources, both staffing and monetary, must be identified to keep production at the predicted levels. Close coordination between our staffs will be essential over the next several months. A followup meeting with the Marine Centers is planned for April 23 to see if we are on track with our actions and plans.

cc:
N/MOA
N/MOP

CLEARANCE

N/MO: R. C. Munson

SIGNATURE AND DATE:

R. C. Munson 2-17-64

HISTORIC GOAL WORKING INVENTORY = 40 SURVEYS
1954 25 SURVEYS
1961 25 SURVEYS

75 SURVEYS - 17

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

FEB 1984

N/MOP:MPK

TO: Commanding Officer
NOAA Ship RAINIER

FROM: N/MOP - Charles K. Townsend

SUBJECT: Sound Velocity Corrections

FEB 29 1984

It has been determined that the velocity tables were calculated incorrectly for all projects in which the new Sound Velocity/Depth Measuring System (SV/D) was used. Projects included are OPR-P114-RA-83, OPR-0168-RA-83, and S-0908-RA-83. Project S-0907-RA-83 used tables from OPR-0168-RA-83.

A "Data Reduction Program" was written by the ship for the HP-97 that incorrectly calculates a velocity correction factor based on the depth (determined from pressure readings) and sound velocity at that depth. Since sound velocity in most cases varies with depth, the water column must be considered in layers with a velocity correction factor determined for each layer. The corrections computed are then summed to arrive at total velocity corrections applicable to given depths. The velocity correction factors must be redone using the "summation of layers" method for all projects.

Another factor not considered in the HP-97 program is the vessel's draft. Velocity tables are tabulated so that the entering argument is the observed depth plus the draft. Using the SV/D, the first layer includes the water column from the surface to the transducer. This fact necessitates a corresponding shift in layer thickness when calculating the first layer correction unless the draft effect is negligible.

For projects OPR-0168-RA-83 and S-0908-RA-83 the incorrect pressure coefficients were entered into the "Coefficient Input Program". Sound velocity and depth values should be recomputed for these projects.

The results of these corrective actions should be submitted as addenda to the appropriate Corrections to Echo Sounding Reports (enclosed) and forwarded to the Nautical Chart Branch, N/MOP21 prior to departure in mid-February. The addendum should include a brief explanation, HP-97 program results (if applicable), layer correction worksheets, graphs, and velocity tables. Refer to the Hydrographic Manual, section 4.9.5.2, for instructions on layering and determining corrections.

Questions regarding this matter should be referred to Dennis Hill, N/MOP211, telephone 527-6853.

National Ocean Service
NOAA Ship RAINIER
1801 Fairview Ave. E
Seattle, WA 98102-3767

February 24, 1984
S221/1601-01/TDR

FEB 29 1984

TO: N/MOP-Radm. Charles K. Townsend, NOAA

FROM: *John P. Vandermeulen*
S221-John P. Vandermeulen, NOAA
Commanding Officer

SUBJECT: Recomputation of Velocity of Sound Correctors

Ref: Letter from N/MOP dated February 8, 1984

As requested, new velocity tables have been computed using the "summation of layers method" for projects OPR-P114-RA-83, OPR-0168-RA-83, and S-0908-RA-83. These tables were originally computed using an HP-97 program written by RAINIER which incorrectly assumed a uniform velocity distribution above the actual depth. The program also did not incorporate vessel draft.

For projects OPR-0168-RA-83 and S-0908-RA-83 it was not necessary to recompute the velocity values. A preliminary SV/D calibration report was accidentally attached in the appendices of the original Sound Velocity Corrections Report. The correct coefficients were used in the calculations.

In recomputing these velocity tables, several minor discrepancies have been found in section 4.9.5.2 of the Hydrographic Manual which provides instructions for determining velocity corrections.

The terms "actual depth", "applicable depth", "applicable actual depth", "observed depth", and "applicable depth from surface" are used somewhat interchangeably. It is recommended the terms be restricted to "actual depth" and "applicable depth from surface". A diagram might also be helpful.

The section does not make clear that the first mid-depth velocity should be between the draft depth and layer

FEB 29 1984

depth and not zero depth and the layer depth as the instructions imply.

There also exists a possibility of error when using program RK530. Unless properly accounted for, minor errors can result in computing the displacement between the velocity curve and the bar check curve. Errors may also occur if the bar check curve and an oceanographic velocity curve are improperly combined into a common velocity curve.

The difficulty arises from the fact that program Rk530 computes a table of applicable depths from surface vs. velocity corrections. Page RK530.05 of the program states that the final velocity table is obtained by plotting as per the Hydrographic Manual. However, the Manual provides instructions for plotting actual depths vs. velocity corrections.

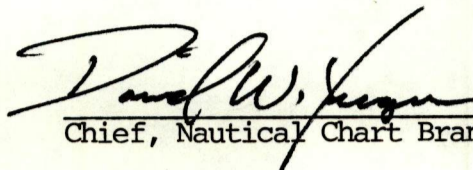
Users who are unfamiliar with the difference may try to plot a bar check curve on an "RK530 curve" without being aware of the difference. The errors can be significant in cases where the velocity correction is relatively large compared to the depth.

A Hydrographic Guideline to resolve these discrepancies would be very helpful and would notify other ships of the potential problems.

Encloseures:

ATTACHMENT TO DESCRIPTIVE REPORT FOR H-10121

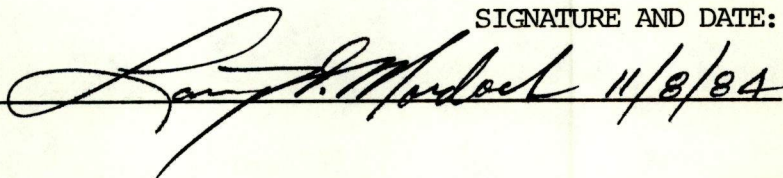
I have reviewed the smooth sheet, accompanying data, and reports of this hydrographic survey. Except as noted in the Evaluation Report, the hydrographic survey meets or exceeds Charting and Geodetic Services (G&GS) standards, complies with instructions, and is accurately and completely represented by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

 11/6/84
Chief, Nautical Chart Branch (Date)

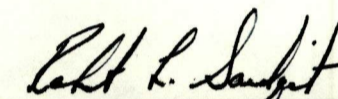
CLEARANCE:

N/MOP2:LWMordock

SIGNATURE AND DATE:

 11/8/84

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.


Director, Pacific Marine Center (Date)

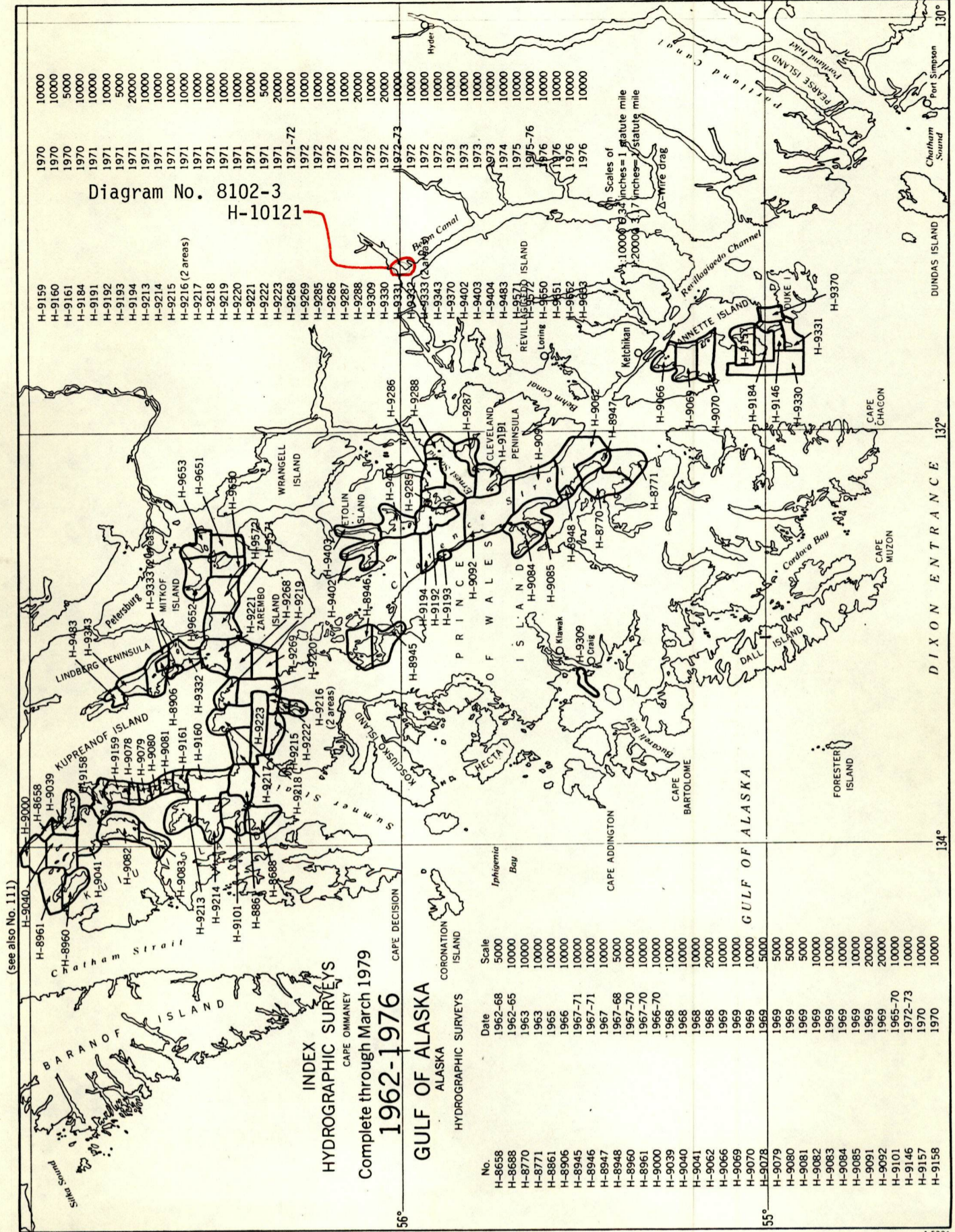


Diagram No. 8102-3
H-10121

(see also No. 111)

INDEX
HYDROGRAPHIC SURVEYS
Complete through March 1979
1962-1976

GULF OF ALASKA
ALASKA
HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-8658	1962-68	5000
H-8688	1962-65	10000
H-8770	1963	10000
H-8771	1963	10000
H-8861	1965	10000
H-8906	1966	10000
H-8945	1967-71	10000
H-8946	1967-71	10000
H-8947	1967	10000
H-8948	1967-68	5000
H-8960	1967-70	10000
H-8961	1967-70	10000
H-9000	1966-70	10000
H-9039	1968	10000
H-9040	1968	10000
H-9041	1968	10000
H-9062	1968	20000
H-9066	1969	10000
H-9069	1969	10000
H-9070	1969	10000
H-9078	1969	5000
H-9079	1969	5000
H-9080	1969	5000
H-9081	1969	5000
H-9082	1969	10000
H-9083	1969	10000
H-9084	1969	10000
H-9085	1969	10000
H-9091	1969	20000
H-9092	1969	10000
H-9101	1965-70	10000
H-9146	1972-73	10000
H-9157	1970	10000
H-9158	1970	10000

Scales of
1:10000 3.9 inches = 1 statute mile
1:20000 1.9 inches = 1 statute mile
1:50000 0.77 inches = 1 statute mile
1:100000 0.39 inches = 1 statute mile
1:200000 0.19 inches = 1 statute mile
1:500000 0.077 inches = 1 statute mile
1:1000000 0.039 inches = 1 statute mile

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10121

INSTRUCTIONS

- A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
- 1. Letter all information.
- 2. In "Remarks" column cross out words that do not apply.
- 3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
17420	4/11/89	ALMACEN	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>full application of soundings from SS. Soundings in agreement with 17422.</i>
17422	4/13/89	ALMACEN	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>full application of soundings from SS.</i>
			Full Part Before After Verification Review Inspection Signed Via Drawing No.
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