

H10870

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. RA-10-07-99
Registry No. H-10870

LOCALITY

State Alaska
General Locality Lynn Canal
Sublocality Saginaw Channel and Barlow Cove

1999

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE JUL 23 2000

HYDROGRAPHIC TITLE SHEET

H-10870

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-10-07-99

State Alaska

General locality Lynn Canal

Locality Saginaw Channel and Barlow Cove

Scale 1:10,000 Date of survey 4/20/99 - 6/7/99

Instructions dated March 5, 1998 * Project No. OPR-0340-RA

Vessel RAINIER (2120), RA-1(2121), RA-2(2122), RA-3(2123), RA-4(2124), RA-5(2125)
RA-6(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by RAINIER Personnel

Soundings taken by echo sounder, ~~beam transducer~~ DSF-6000N, Kundersen 320M, RESON 8181 MB,
SeaBeam 1050D MKII (Low Frequency)

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: I. Almacen Automated plot by HP Design Jet 750C

Verification by E. Domingo, R. Davies, R. Mayor, G. Nelson, D. Doles

Soundings in fathoms ~~XXXX~~ at ~~XXXX~~ MLLW and tenths (data collected in Meters)

REMARKS: All times are UTC, revisions and marginal notes in black were
generated during office processing. All separates are filed
with the hydrographic data, as a result page numbering may be
interrupted or non-sequential.
All depths listed in this report are referenced to mean lower
low water unless otherwise noted.

- * Change #1 - March 30, 1998
- Change #2 - April 12, 1999
- Change #3 - May 6, 1999

AWOIS / SURF

PROGRESS SKETCH

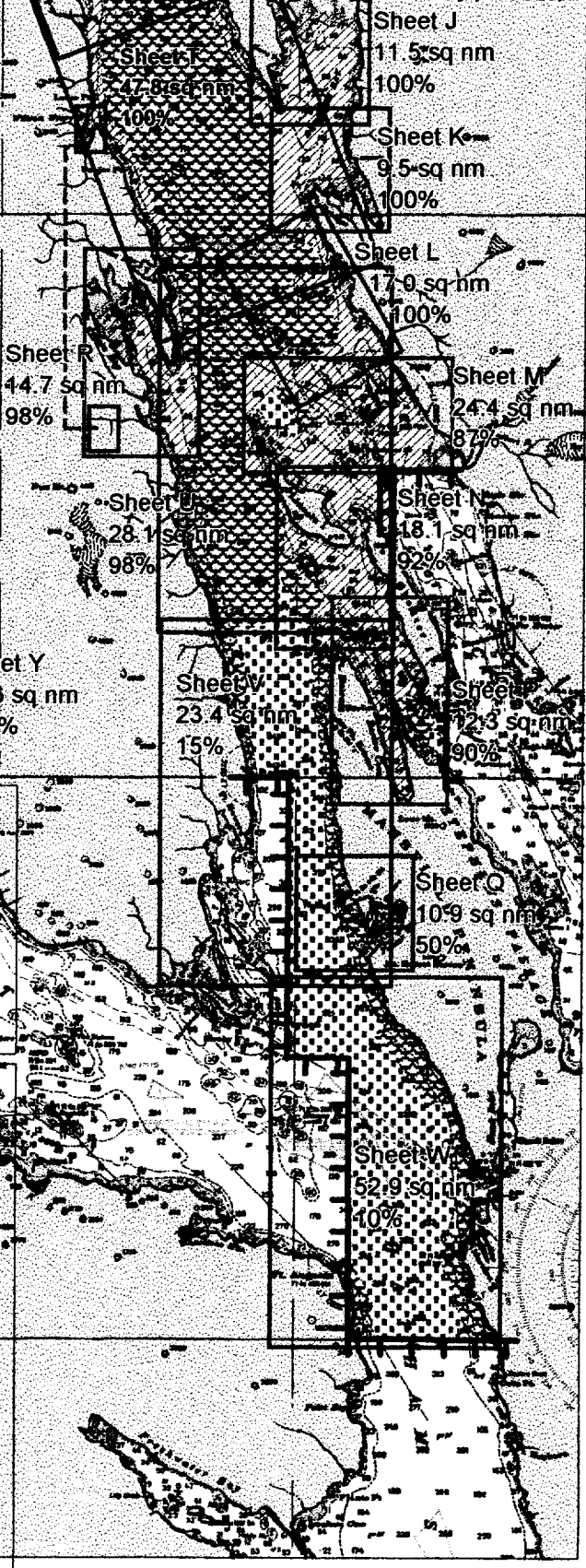
May, 1999
 OPR-0340-RA-99
 Lynn Canal, Alaska
 Capt. A. D. Anderson
 COMMANDING
 Chart 17300

	APRIL
	MAY
	JUNE

Downtime Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	2	0	0
Electronic -Hr	2	2	0

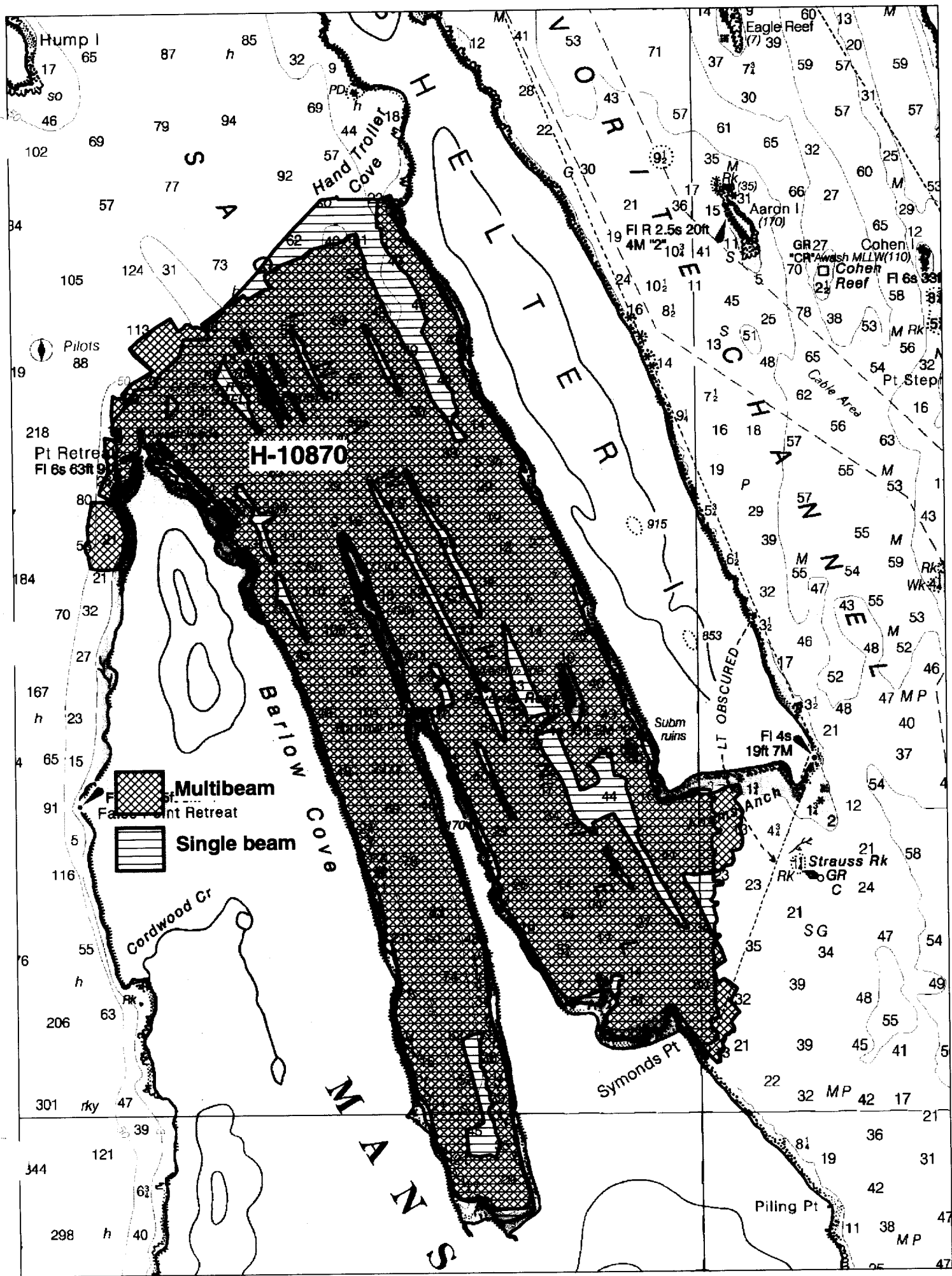
Accomplished	April	May	June
LNM Hydro	2910	679	41.8
LNM SSS	0	0	0
SQ NM	43.89	144.17	102.3
AWOIS Invest.	0	9	5
Other Invest.	0	4	2
LNM Multibeam	174.4	1053.64	290.5
Days at Sea	28	26	11

Sheet	Reg No	Started	Percent	Completed	Submitted	SQNM
J	H-10860	4/6	100	5/24		11.5
K	H-10861	4/6	100	5/22		9.5
L	H-10862	4/8	100	5/25		17.0
M	H-10866	4/14	100	6/3		24.4
N	H-10865	4/14	100	6/7		18.1
P	H-10870	4/20	100	6/7		12.3
Q	H-10879	5/1	100	6/5		10.9
R	H-10869	4/18	100	6/2		14.7
T	H-10864	4/13	100	5/25		47.8
U	H-10880	5/3	100	6/2		28.1
V	H-10881	5/2	100	6/5		23.4
W	H-10882	5/6	100	6/8		52.9
Y	F00451	5/20	100	5/20		0.16
X	H-10883	5/10	100	5/20		19.6



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H-10870

 **Multibeam**
Face Point Retreat

 **Single beam**

Cordwood Cr

Symonds Pt

Piling Pt

Hump I
65
17
so
46

Eagle Reef
60
13
7
39

Aaron I
170

Cohen Reef
110
69

Strauss Rk
GR C

Subm ruins

LT OBSCURED

Anch

Pilots
88

Pt Retreat
FI 6s 63ft 9s

Fl 4s 19ft 7M

rk
47

39

h
40

77

73

113

19

218

80

184

70

167

65

91

116

6

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301

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298

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80

184

70

167

65

91

116

6

206

301

344

298

77

73

113

19

218

80

184

70

167

65

91

116

6

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301

344

121

62

92

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62

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Descriptive Report to Accompany Hydrographic Survey H10870

Field Number RA-10-07-99

Scale 1:10,000

June 1999

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT ✓

This hydrographic survey was completed as specified by Project Instructions OPR-O340-RA dated March 5, 1998, Change Number 1, dated March 30, 1998, Change Number 2, dated April 12, 1999, and Change Number 3, dated May 6, 1999. Survey H10870 corresponds to Sheet P as defined in the sheet layout. This survey will provide contemporary hydrographic survey data as part of a continuing program to improve chart coverage of the Inside Passage in southeast Alaska. Requests for hydrographic surveys and updated charts in this area have been received from the Southeastern Alaska Pilot's Association (SEAPA) and the commercial fishing industry.

B. AREA SURVEYED (See EVAL RPT, Sec B)

The survey area for H10870 is located in Lynn Canal, Alaska, from Saginaw Channel to Barlow Cove. Survey limits are shown below in Figure 1. The survey's northern limit is latitude 58°26'26"N and the southern limit is the southern end of Barlow Cove. The survey's eastern limit is longitude 134°49'50"W and the western limit lies just west of Point Retreat at longitude 134°49'50"W. Data acquisition was conducted from April 20, 1999 to June 7, 1999 (DN 110 to 158).

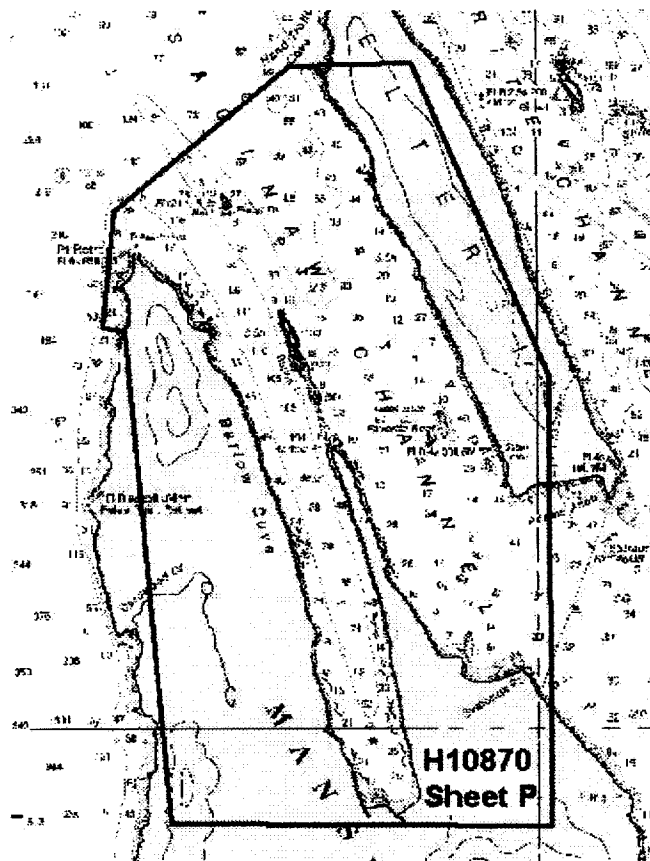


Figure 1 – Survey Limits

C. SURVEY VESSELS ✓

Data were acquired by RAINIER and her survey launches (vessel numbers 2120, 2121, 2122, 2123, 2124, 2125 and 2126) as noted in the Survey Information Summary included with this report. See project related data for OPR-O340-RA for vessel descriptions. No unusual vessel configurations or problems were encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All vertical beam echo sounder (VBES) data were acquired using HYPACK version 8.9 and preliminary processing was accomplished with HPS version 9.3 and MapInfo 5.0. Final Detached Positions, Features, and Soundings based on predicted and observed tides were saved in MapInfo format. Raster images registered in MapInfo facilitated chart and prior survey comparisons. ✓

Shallow water multibeam (SWMB) echosounder data were acquired using the Reson SeaBat 8101 with ISIS version 4.25 and processed using CARIS HIPS software version 4.3. ✓

Multibeam data collected by RAINIER were acquired using the SeaBeam 1050D MKII multibeam echosounder and Elac HydroStar ONLINE software version 2.8.5b with Triton Elics ISIS software version 4.32 and processed using CARIS HIPS software version 4.3. ✓

Reson 8101 and SeaBeam 1050D MKII depth data were reviewed with the CARIS Hydrographic Data Cleaning System (HDGS). Depth fliers were identified and manually flagged as "rejected". Vessel positioning and attitude data from each system were similarly displayed and manually cleaned. Additionally, instantaneous speed as computed from the positioning data was checked for speed jumps exceeding 2.0 knots as an indication of potential position fliers. ✓

After review and cleaning, Reson 8101 depth, position and attitude data were merged with sound velocity, predicted tide and dynamic draft correctors to compute the true depth and position of each sounding. These processed data were extracted into a CARIS Workfile using "line-by-line" shoal-biased binning at a density of 5 meters x 5 meters. These binned soundings were then suppressed in CARIS using a search radius of 2.5 mm at survey scale, and then exported into HPS through HP Tools. For this survey, the outer ten beams of the Reson 8101 on each side of the swath (beam numbers 1-10 and 92-101) were flagged as rejected during cleaning, reducing the effective swath width to 120°. ✓

Heave, roll and pitch data were applied to raw sounding data during acquisition in the HydroStar program to the SeaBeam 1050D data. After review and cleaning, SeaBeam 1050D depth, position and heading data were merged with sound velocity, predicted tide and dynamic draft correctors to compute the corrected depth and position of each sounding. The heave, pitch, and roll data were manually removed from the HDGS data to prevent these data from being applied twice. The heave, pitch and roll values have been archived in TAR format and are submitted with the HDGS data in the event that they are needed at a future date. These data were then extracted to a CARIS Workfile using shoal-biased "line-by-line" binning using a bin size of 5 meters x 5 meters. These soundings were further suppressed in CARIS with a shoal bias using a search radius of 2.5 mm at survey scale. Processed soundings were then exported into HPS through HP Tools. ✓

Survey H10870 is defined in HPS as sheet 6. The project name in HDGS is "O340_SheetP" and the workfile name is defined as "lynn_p."

All final plots were created in MapInfo using UTM Zone 8 projection.

A complete listing of software is included in Appendix VI. *

** Filed with the hydrographic data.*

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. ^{Concur.} However, it should be noted that the Reson 8101 provides a low-resolution digital SSS record of the SWMB swath. This SSS imagery is primarily used to aid in final processing of the SWMB depth data in determining whether anomalous soundings are true features or noise. ✓

F. SOUNDING EQUIPMENT ✓

Three different categories of echosounder systems were used and are described below. The individual system(s) chosen for use in a given area were decided at the discretion of the Hydrographer using the guidance stated in the Project Instructions and depended upon the limitations of each system, the bottom topography, the water-depth, and the ability of the survey vessel to safely navigate the area. ✓

1. Launch Vertical Beam Echo Sounder (VN 2121, 2122, 2123, 2124, 2125, 2126) ✓

The vertical beam echo sounders utilized for this survey were the Raytheon DSF-6000N (VN 2122, 2124, 2125) and Knudsen 320M (VN 2121, 2123, 2126), which are dual frequency (100 kHz, 24 kHz), digital recording singlebeam fathometers with analog paper traces. Soundings were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 250 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. VBES launches were used to collect mainscheme hydrography in areas that were considered too hazardous or too shallow for shipboard SeaBeam 1050 MK II coverage, generally areas less than 150 meters of depth. In addition, singlebeam launches were used to perform all shoreline verification. VBES serial numbers are included in Appendix VI. *

2. Launch Shallow Water Multibeam (VN 2121, 2123, 2126) ✓

The shallow water multibeam (SWMB) system utilized for this survey was the Reson SeaBat 8101, which is a 240 kHz multibeam system that measures relative water depths across a wide swath perpendicular to the vessel's heading. The Reson 8101 uses a 150° swath, consisting of 101 individual 1.5° x 1.5° beams. A TSS POS/MV Position and Orientation Sensor was used to correct for the effects of vessel motion during survey operations. Serial numbers for the Reson 8101 and POS/MV are included in Appendix VI. *

Although the Reson 8101 was designed to survey to depths in excess of 300 meters, RAINIER has discovered that maximum attainable depths are approximately 80-150 meters, depending on sea conditions and bottom topography. However, the installation this winter of an extended range projector on VN 2126 has extended the maximum depth range by 30-40%. SWMB launches were used to collect full-bottom coverage of select areas identified during vertical beam echosounder hydrography, generally all areas determined to be less than 100 meters deep that could safely be investigated without the risk of damaging the SWMB transducer. ✓

VBES data acquired concurrently with SWMB were compared to nadir beams of the shallow water multibeam online during data acquisition. In addition, digital VBES data is sent to ISIS during SWMB acquisition, which then focuses the shallow water multibeam on a variable "gate" determined from the VBES data. The latter is extremely helpful in areas of extreme relief, when the shallow water multibeam tends to lose bottom lock. VBES data acquired during SWMB were not used for final sounding plot compilation, and are not included with the digital survey data. ^{concur.}

* Filed with the hydrographic data.

3. Ship Shallow Water and Intermediate Depth Multibeam (RAINIER) ✓

The ship shallow water and intermediate depth multibeam utilized for this survey was the SeaBeam 1050D MKII, which is a hull-mounted, dual frequency (180 kHz, 50 kHz), high resolution multibeam echosounder system for shallow and medium water depths. A TSS 335B attitude sensor was used to correct for the effects of heave, roll, and pitch, and a Sperry MK227 gyro was used for heading. The SeaBeam 1050D MKII ensonifies the seafloor utilizing two narrow beam width transducer arrays pinging into 14 sectors. The receiving beamformer generates 3 narrow beams each sector with a beam width of 1.5° and a spacing of 1.25°. Three subfans are one total fan. Hence, there are 14 sectors x 3 beams x 3 subfans resulting in 126 total beams. Serial numbers for the SeaBeam 1050D MKII, TSS335B, and Sperry MK227 are included in Appendix VI. *

The high frequency array (180 kHz) is used to acquire soundings ranging from 10 to 300 meters, while the low frequency array (50 kHz) is used to acquire soundings ranging from 100 to 3100 meters. Low frequency was used exclusively on survey H10870 with an acquisition swath width of 128°. During processing, all soundings beyond a maximum angle of 50° off nadir were rejected to further reduce noise in the outer beams.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Water Level Correctors ✓

Predicted tide tables were generated for both HPS and CARIS using Nautical Software's "Tides & Currents" version 2.5. Tide correctors for H10870 were based on the location William Henry Bay, Lynn Canal (945-1705) which uses Juneau (945-2210) as a reference station. Tide table HPS #99 was used only for preliminary processing of the VBES soundings. CARIS tide table "juneau99new.tid" was also created using Tides & Currents data and was applied to SWMB data in HDCS.

Once data acquisition was complete and all sounding data consolidated in HPS, preliminary observed tides from the Center for Operational Oceanographic Products and Services (CO-OPS) gauge for Juneau (945-2210) were downloaded from the Internet and used to create HPS table #1. The MapInfo tidal zoning table supplied by CO-OPS was then imported into HPS using the MapBasic application HPT_UTIL.MBX and HP Tools v.9.4.1. Tide zone correctors were then computed and applied to all soundings in HPS (SeaBeam, SWMB, & VBES) to produce a final sounding plot.

Listings of HPS tide tables used for H10870 are included in the Separates of this report. ^{*}Tidal zoning correctors as provided in the Project Instructions for H10870 are provided in the Survey Information Summary included with this report.

The continuously operating National Water Level Observation Network (NWLON) stations at Juneau, Alaska (945-2210), Sitka, Alaska (945-1600), and Skagway, Alaska (945-2400) are the primary control stations for datum determination. RAINIER personnel installed a Sutron 8200 tide gage at Cove Point (945-2346) on April 4, 1999 and at Barlow Cove (945-2318) on April 4, 1999. The Cove Point gage was removed on June 2, 1999 and the Barlow Cove gage was removed June 7, 1999. Refer to the Field Tide Notes and supporting data in Appendix V for individual gage performance and level closure information. This information has been forwarded to N/CS41 in accordance with HSG 50 and FPM 4.8. A request for approved tides was forwarded to N/CS41 in accordance with FPM 4.8. *Approved Tide Note dated October 6, 1999 is attached.*

** Filed with the hydrographic data.*

Sound Velocity Correctors ✓

Ten sound velocity casts were used for this survey. Five were used for shallow water multibeam purposes, three for the ship's SeaBeam system and two for vertical beam echosounders. Information on the casts is included in the Survey Information Summary report and in the Separates.*

Sound velocity casts were acquired using a SBE SEACAT Profiler (S/N 219, S/N 2477), calibrated November 13, 1998. Calibration reports are included with the project data for OPR-O340-RA-99. Velocity correctors were computed using the PC program VELOCWIN version 4 beta 2, which directly generates sound velocity correction tables for both CARIS and HPS. ✓

For VBES launches, sound velocity correctors were applied to the raw sounding data in HPS during post processing. For Reson 8101 and SeaBeam 1050D MKII data, sound velocity correctors were applied in CARIS during post processing. ✓

Vessel Offset Correctors ✓

The following table shows when the vessel offset correctors used for this survey were last measured:

Vessel No.	Date of Static Draft and Transducer Offset Measurements	Method of Settlement and Squat Measurement	Date of Settlement and Squat Measurement	Location of Settlement and Squat Measurement
2120	March 1999	OTF	March 1999	Port Angeles, WA
2121	March 1999	OTF	March 1999	Port Angeles, WA
2122	March 1999	Rod leveling	March 1999	Port Angeles, WA
2123	March 1999	OTF	March 1999	Port Angeles, WA
2124	March 1999	Rod leveling	March 1999	Port Angeles, WA
2125	March 1999	Rod leveling	March 1999	Port Angeles, WA
2126	March 1999	OTF	March 1999	Port Angeles, WA

*Settlement and squat correctors, static draft measurements and vessel offsets are included with the project data for OPR-O340-RA-99.*Offset tables # 1-6 in HPS correspond to the last digit of the respective vessel number, with RAINIER being designated as #7 for HPS processing. For VBES launches, offset tables were applied to the raw sounding data in HPS during post processing.

Heave, Pitch, Roll and Heading, Including Biases and Navigation Timing Error ✓

SWMB launches (VN 2121, 2123 and 2126) utilize a TSS POS/MV Model 320 Position and Orientation System (POS), which provides accurate navigation and attitude data (heave, pitch, roll, and heading) to correct for the effects of vessel motion during survey operations. The POS generates attitude data in three axes (roll, pitch, and heading) to an accuracy of 0.05° or better. Heave measurements supplied by the POS maintain an accuracy of 5% of the measured vertical displacement for movements that have a period of up to 10 seconds. The POS delivers heading measurements by two distinct methods. First, the Dynamic Heading Alignment determines the vessels heading by using the data supplied by the Internal Measurement Unit (IMU) and GPS receivers to achieve heading that is, at best, accurate to within 0.35°. This method suffers from drift but is relatively unaffected by noise. Second, the GPS Azimuth Measurement System (GAMS) determines the geographic vector between two GPS antennas fixed to the vessel by comparing the phase of satellite signals they receive. The error from this method is largely due to noise, but exhibits no drift. The POS uses the advantages of each method to compensate for the disadvantages of the other to arrive at an optimal accuracy of 0.05°. Serial numbers are located in Appendix VI. *

** Filed with the hydrographic data .*

RAINIER utilizes a TSS 335B attitude sensor in conjunction with the SeaBeam 1050D to correct for the effects of heave, roll, and pitch during survey operations. Heave resolution is 1cm, with an accuracy of 5cm or 5% of the range, whichever is the greater. The roll and pitch resolution is 0.01° with an accuracy of 0.05° to 0.10°. During acquisition, SeaBeam depth data are corrected for roll in HYDROSTAR to account for beam steering at the transducer face. A Sperry MK227 digital gyro was utilized for vessel heading, which has a resolution of 0.1° and an accuracy of better than 1°. Serial numbers are located in Appendix VI. *

SWMB launches and RAINIER Vessel Configuration Files (VCF) were created within the CARIS program VCFEDIT, and offset values were applied to the multibeam sounding data during post-processing in CARIS. VCF files define the physical relationships between the various components that comprise the systems. The VCF files contain offsets, dynamic draft, timing errors, and heave, roll and pitch biases. System biases for the SWMB launches were determined during patch tests conducted at Port Angeles, WA on March 26-28, 1999. System biases for RAINIER were determined during a patch test conducted in Lynn Canal on May 21, 1999. Printouts of each vessel's VCF are included in the Project Related Data for OPR-O340-RA* and the VCF's themselves are included with the digital HDCS data.

H. HYDROGRAPHIC POSITION CONTROL (See EIAL RPT, Secs. H & I)

The horizontal datum for this project is NAD 83. See the OPR-O340-RA-99 Horizontal Control Report for more information.

All vessels were positioned using differential GPS (DGPS). VHF reference stations were set up at stations JOE and CURTIS. Due to its proximity to the H10870 survey area, station CURTIS was used as the primary station for VHF differential correctors. Differential corrections from the US Coast Guard Beacon at GUSTAVUS were also utilized during this survey. DGPS reference station information is ^{included at} located in ~~Appendix III~~ of this report. Serial numbers for positioning equipment are included in the Appendix VI. *

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. Differential corrections from two reference stations were received by the independent launch positioning systems as they were rafted together with their GPS antennae 2-3 meters apart. RAINIER performance checks were conducted weekly by comparing DGPS positions acquired by RAINIER's positioning system and the launches positioning systems, while at rest in the davits. Copies of DGPS performance checks are included in Appendix III. *

I. SHORELINE (See EIAL RPT, Sec. J)

No official source shoreline data were supplied to RAINIER by N/CS341 for any of the eastern shoreline of Lynn Canal for the entire project. NOS Chart 17316 (18th edition, July 18, 1998) was enlarged to a scale of 1:40,000, and the shoreline was digitized by RAINIER personnel to provide digital shoreline in the survey area. Shoreline from Chart 17316 was used as the shoreline source. ^{CONCUR} RAINIER personnel verified or disproved shoreline features during shoreline verification. In certain areas, the charted shoreline was shifted based upon survey tracklines and detached positions. The revised charted shoreline depicted on the DP & BS plot and Final Sounding plot is shown in brown, and is intended for orientation purposes only. ^{CONCUR} However, the Hydrographer recommends that the revised charted shoreline, based on field notes, detached positions and survey tracklines, be used during chart compilation to better depict the actual shoreline in the survey area. ^{CONCUR}

Method of Shoreline Verification ✓

Shoreline verification was conducted near predicted low water in accordance with the Project Instructions and FPM 6.1 and 6.2. For this survey the general limit of safe navigation of a survey launch is 5-30 meters offshore of apparent low tide. Water depths along this limit of safe navigation are generally 2-5 meters at Mean Lower Low Water (MLLW). Features shown inshore of the Navigable Area Limit Line (NALL) are the hydrographer's representation of the shoreline observed while slowly transiting along the shore, and are

* Filed with the hydrographic data.

intended to aid chart compilation. *Concur.*

Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms and processed in HPS. These indicate significant features and features not found on the chart.

A detailed "DP and BS Plot" is provided showing all detached positions and bottom samples with notes relating to each feature. Updated shoreline and features are also depicted on the final sounding plot.

Charted Features ✓

Charted rocks were either located as charted, identified as new rocks, high points or extensions of ledges and reefs except as noted below.

A search was conducted for a charted rock (AWOIS #52409) in Barlow Cove and it was not found. It should be noted, however, that a new reef (refer to Pos. # 29,000 – 29,002) was found approximately 200 meters south of the reported area. *Delete the presently charted rock and chart the area with the new reef based on the present survey.*

A discrepancy exists between the charted and surveyed positions of Favorite Reef and the small reef at the southwest end of Shelter Island. These discrepancies are discussed below, and are depicted in Figure 2 below. *Chart the area of the reef based on the latest survey information.*

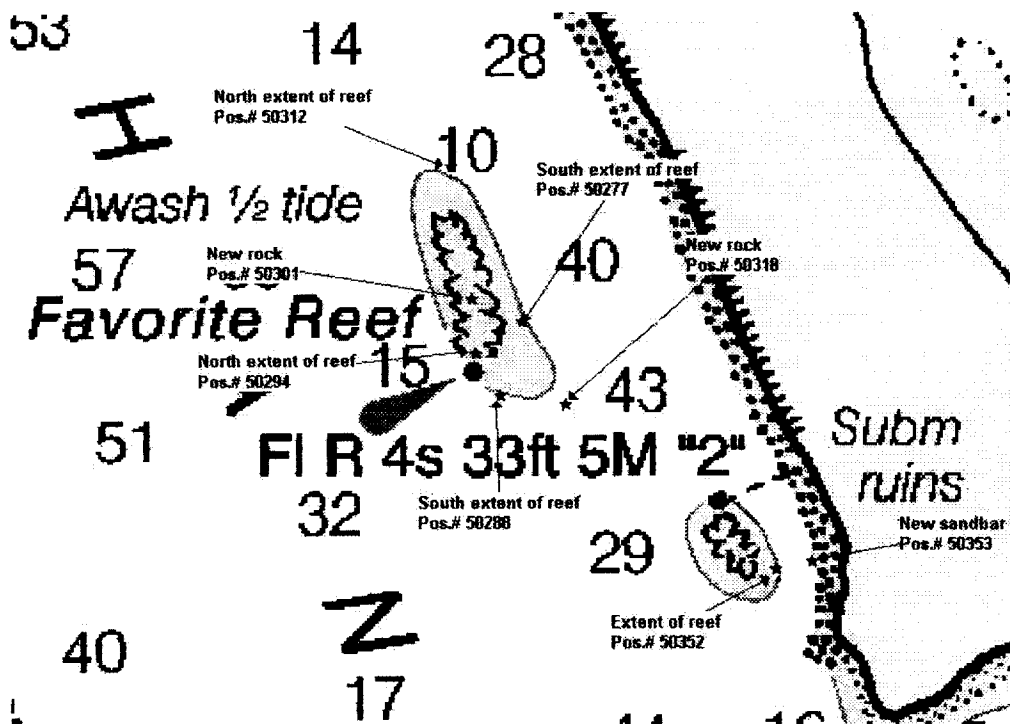


Figure 2 – Favorite Reef Shoreline Discrepancy

Favorite reef was found to be over 100 meters from its charted position. Position #50312 at 58°23'08.6"N, 134°51'46.9"W depicts the north extent of the reef, and position #50277 at 58°22'52.9"N, 134°51'34.0"W depicts the south extent of the reef. In addition, a separate section of Favorite Reef, where Light "2" is located, was positioned. The north extent of the reef is defined by position #50294 at 58°22'49.6"N, 134°51'42.4"W and the southern extent is defined by position #50288 at 58°22'45.5"N, 134°51'38.3"W.

Two new rocks were discovered in the vicinity of Favorite Reef. A new rock at 58°22'55.2"N, 134°51'44.1"W (Pos. #50301) was found west of the new limits for Favorite Reef. A second new rock at 58°22'44.4"N, 134°51'26.0"W (Pos. #50318) was found south of the new limits for Favorite Reef. See Figure 2 above. *Chart the two (2) new rocks based on the latest survey information.*

The small charted reef at the southwest end of Shelter Island was found east of its charted position. The extent of this reef was defined by position 50352 at 58°22'28.0"N, 134°50'46.4"W. In addition, a sandbar connects this reef to the shoreline of Shelter Island. This sandbar is defined by position #50353 at 58°22'28.8"N, 134°50'39.9"W. *Chart the feature and the area based on the present survey.*

The charted "Subm ruins" at 58°22'35.11N, 134°50'57.5W was not investigated (also depicted in Figure 2). This feature did not appear in the AWOIS database. The Hydrographer recommends retaining the Subm ruins" as charted. *Concur.*

A new pier was found along the eastern end of Pt. Retreat at 58°24'39.533"N, 134°57'14.825"W (Pos. #22424), and is approximately 20 meters high. This pier serves the Pt. Retreat Lighthouse for use by the U.S. Coast Guard. This pier is depicted in red on the DP and BS plot and final sounding plot.

Recommendations ✓

The charted shoreline should be revised using the fieldwork notes as recorded in the Mapinfo digital files named "p_shoreline" and "p_shorelineupdates". *Concur.*

J. CROSSLINES ✓

VBES crosslines totaled 14.91 nautical miles, comprising 7.15% of mainscheme VBES hydrography. VBES crosslines agreed to within 10 meter with VBES mainscheme hydrography in regions of relatively flat bathymetry. VBES and SWMB data agree to within 1 meter of one another and SWMB crosslines generally agreed to within 0.1 meters with mainscheme SWMB hydrography in regions of low vertical gradients. ✓

Ship multibeam and VBES tended to agree within 2 meters of each other in regions of low vertical gradients. Larger differences (2-5 m) for ship multibeam to VBES were noted, but are a function of bottom slope, water depth, horizontal positioning, beam width, and echo return processing. The greatest differences occurred in areas of steep relief. *Concur.* ✓

The Quality Control Report (CARIS-HIPS) for the checkline file averaged 94.92% with a depth tolerance of 0.023. See Appendix VI for detailed report. *

K. JUNCTIONS (*See EIAL RPT, Sec. L*)

The following contemporary surveys junction with H10870, and are depicted in Figure 3 below.

Registry #	Sheet Letter	Scale	Date	Junction side
H10865	Sheet N	1:10,000	1999	North
H10881	Sheet V	1:20,000	1999	West
H10880	Sheet U	1:20,000	1999	North

Soundings from these junction surveys agreed well with those on H10870, matching within 1 – 2 meters, especially in waters less than 150 meters. In deeper waters, soundings were generally within 1 – 5 meters.

Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after application of smooth tides.

Filed with the hydrographic data.

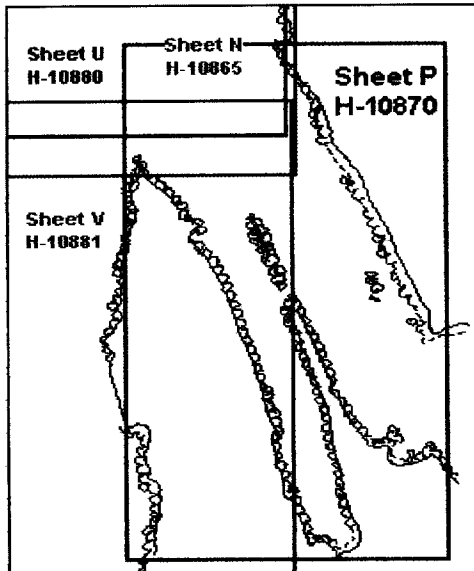


Figure 3 – Junction Surveys

L. COMPARISON WITH PRIOR SURVEYS (See EVAL RPT, Sec M)

Four prior surveys were conducted in the H10870 survey area that date from 1884-1922. Below lies a table and a sketch (see Figure 4) that depict the prior surveys that share common area with H10870.

Registry #	Scale	Date	Area Covered
H1602A	1:40,000	1884	Covers the entire survey
H2056	1:40,000	1890	Covers the entire survey except for Barlow Cove
H3986WD	1:20,000	1917	Covers the entire survey except for the southern ends
H4228	1:40,000	1922	Covers a very small section of the northwestern end
<i>H-2059</i>	<i>1:20,000</i>	<i>1890</i>	<i>Covers the area of Barlow Cove.</i>

Prior survey soundings were found to be in fair agreement with those from the current survey. Least depths over shoals and features from the current survey were generally shoaler than, or in agreement with prior surveys. This is primarily attributable to increased bottom coverage and horizontal accuracy obtained with modern positioning and sounding equipment. *Concur.*

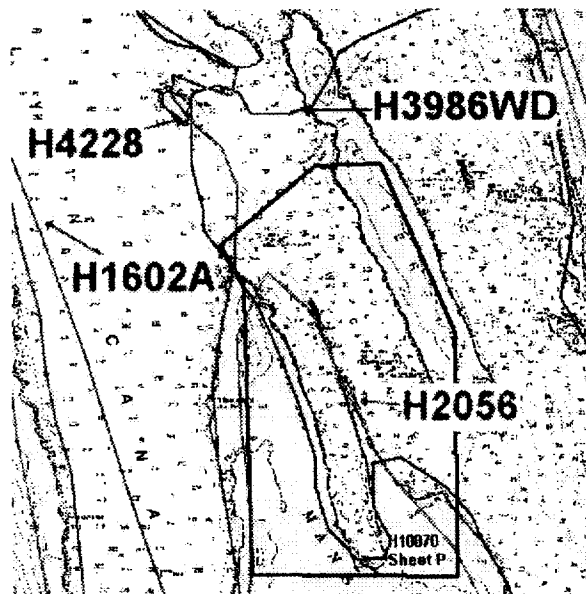


Figure 4 – Prior Surveys

Prior survey H1602A has soundings generally in agreement with current survey soundings. ^{current.} The soundings from this prior, however, are only given for the areas around Adam's Anchorage at the southern end of Shelter Island, the cove just northwest of Symonds Point, and the southern end of Barlow Cove.

Prior survey H2056 covers the bulk of H10870 and supplies the largest number of prior soundings that correspond with the current project. Most of the soundings for prior H2056 are in good agreement. Where soundings were in disagreement, current survey soundings were usually shoaler by no more than 1 or 2 fathoms. One major disagreement, however, is that of a prior sounding of 53 fathoms located at 58°26'00"N, 134°55'29"W, which corresponds to an area of 65-fathom soundings from the current survey project (Pos. # 30220 - 30222). The difference is shown in Figure 5. *(Chart the area based on the latest survey.)*

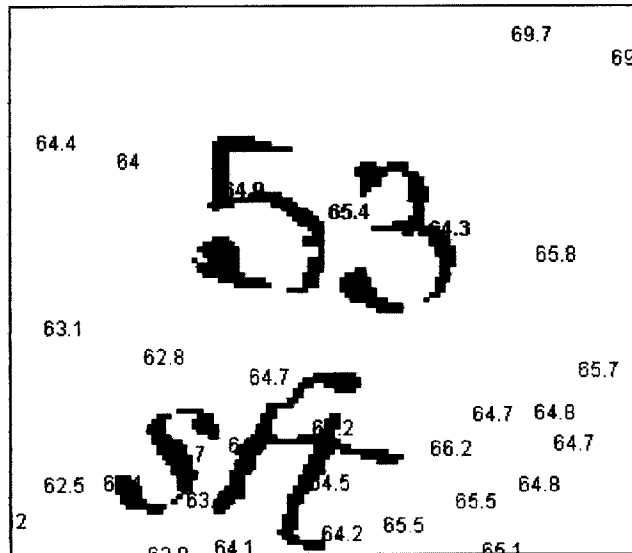


Figure 5 – Discrepancy between prior survey H2056 and current survey soundings.

Prior H3986^{WD} and H4228 are both wire-drag surveys. Although a small section of prior H4228 survey limits fall within the limits of survey H10870, there are no wire drag lines in the common area. H3986WD covers most of the survey, but drag lines were only run around the area north of Point Retreat, northwest of Symonds Point, and around Faust Rock. These drag lines indicated shoaling north of Point Retreat and around Faust Rock, but no depths were posted. Comparisons with the soundings from the current survey tend to agree with the shoaling tendency found with the wire drags. *No significant bangs or groundings were noted on these prior surveys except an indication of shoaling N of Point Retreat & around Faust Rk.* Final comparisons will be done at PHB after application of approved tides.

M. ITEM INVESTIGATION REPORTS ✓

There were two Automated Wreck and Obstruction Information System (AWOIS) items assigned for survey H10870.

AWOIS 52409 ✓

1. Area of Investigation

AWOIS # 52409

Reported Position: Latitude: 58/21/41N
Longitude: 134/54/19W

Type of Feature: Rock Awash

State and Locality: Barlow Cove, AK

Datum: NAD83

Reported Depth: Awash

2. Description of Source Item ✓

LN35/89 17th CGD; rock awash reported in Lat 58/21/41 N, Long 134/54/19 W.

3. Survey Requirements ✓

Visual search; Vertical Beam Echosounder search; and Dive Investigation. 200 meter search radius.

4. Method of Investigation ✓

On DN 141, VN 2125 conducted a 200 m search radius using Vertical Beam Echosounder running 10 meter development line spacing. Additionally, a visual search was conducted for approximately 15 minutes; water visibility was approximately 5 m.

5. Investigation Results ✓

AWOIS 52409 was disproved after conducting the 200 meter search radius investigation. However, it should be noted that a new reef (refer to Pos. # 29,000 – 29,002) was found approximately 200 meters south of the reported area. Figure 6 illustrates the findings below:

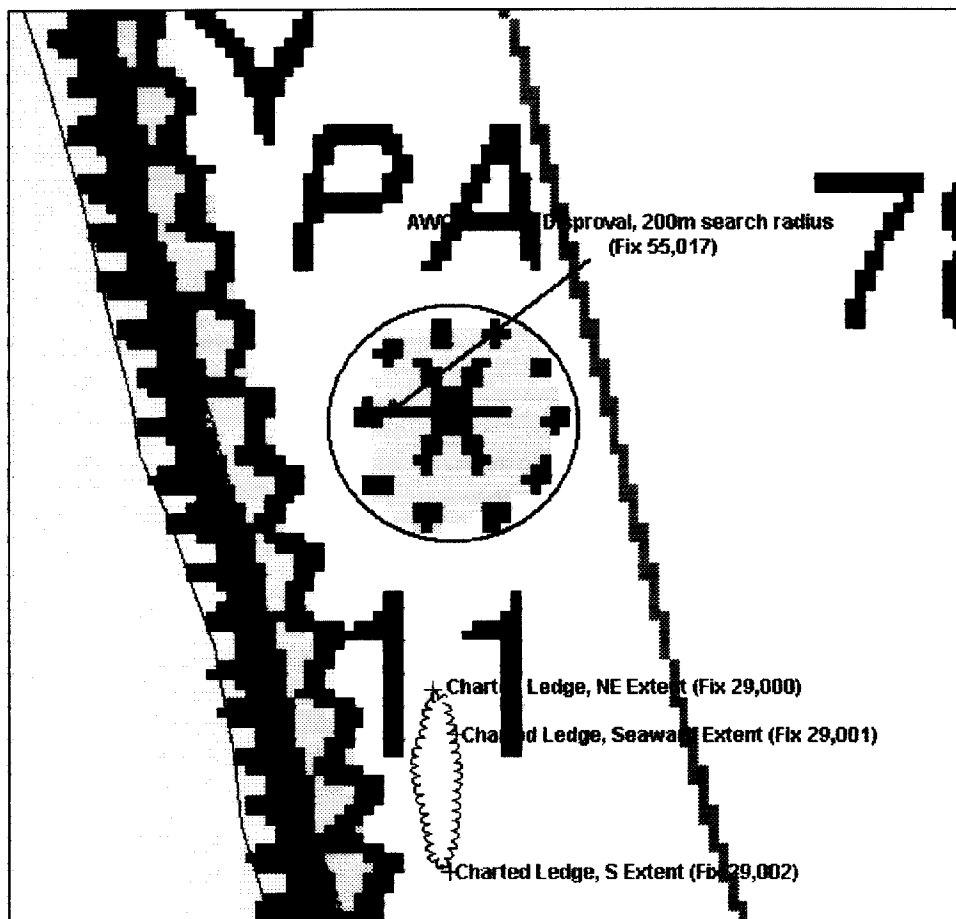


Figure 6 – AWOIS 52409 investigation site in Barlow Cove with location of new reef. ✓

6. Comparison with Prior Surveys ✓

Prior surveys in the area showed no indication of either the current charted rock or the new reef. *CONCUR .*

7. Comparison with the Chart and Charting Recommendation ✓

AWOIS 52409 was compared to Chart 17316 (18th Edition; 7/18/98; 1:80,000). The Hydrographer recommends removing the rock awash symbol ^(PA) (at 58°21'41"N, 134°54'16"W) from Chart 17316. *CONCUR . Chart the area based on the present survey .*

AWOIS 52410 ✓

1. Area of Investigation ✓

AWOIS # 52410

Reported Position: Latitude: 58/22/18N
 Longitude: 134/52/00W

State and Locality: Saginaw Channel, AK
 Datum: NAD83
 Reported Depth: 17 fathoms

Type of Feature: Gradual shoaling

2. Description of Source Item ✓

CL466/38 – USS Salt Lake City; continuous soundings were taken while passing through Saginaw Channel. There was a gradual shoaling and a sounding of 17 fathoms was obtained. Position was by bearing and distance. Position scaled from chart.

3. Survey Requirements ✓

Vertical Beam Echosounder, Multibeam Survey, 200% Side-Scan Sonar Survey in a 500 meter search radius.

4. Method of Investigation ✓

On DN 141, VN 2125 conducted a 500 m search radius using VBES running 10 meter development line spacing.

5. Investigation Results ✓

Echosounder development on DN 141 determined that a 15.8 fathom shoaling (fix # 55155) is present at the AWOIS location in Saginaw Channel. Figure 7 illustrates the findings below:

6. Comparison with Prior Surveys ✓

Prior surveys in the area showed no indication of the shoaling. *CONCUR .*

7. Comparison with the Chart and Charting Recommendation: ✓

AWOIS 52410 was compared to Chart 17316 (18th Edition; 7/18/98; 1:80,000). The Hydrographer recommends charting present survey depths in the area after application of approved tides. *CONCUR .*

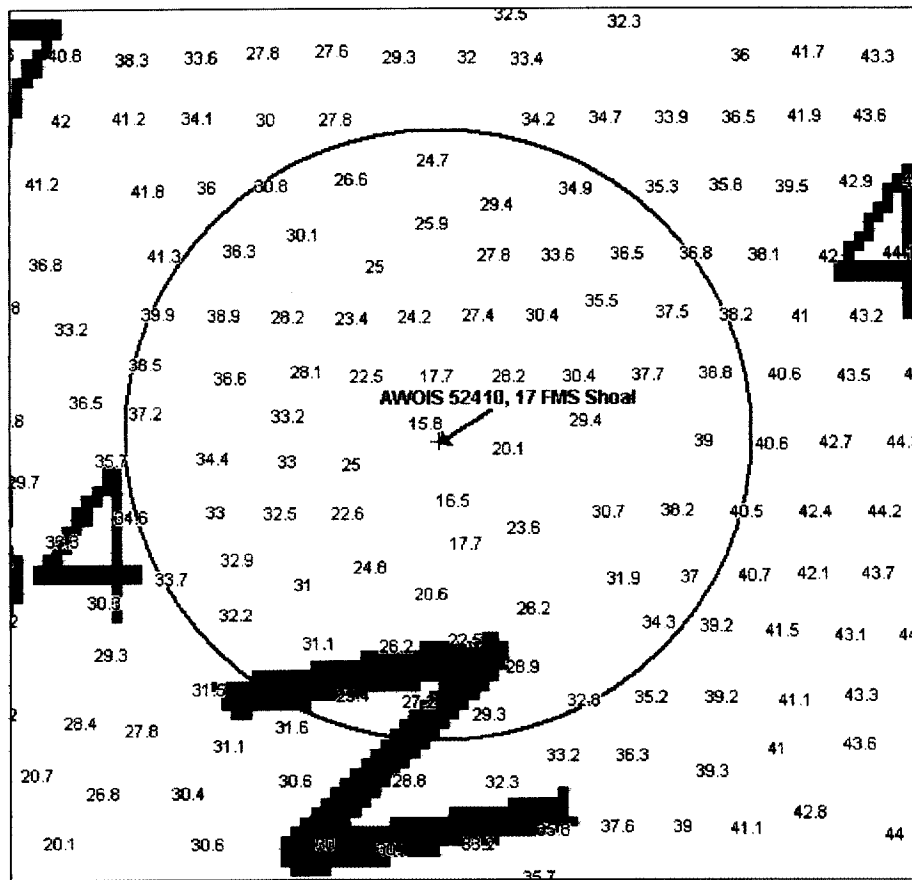


Figure 7 – AWOIS 52410 investigation site and shoal sounding.

N. COMPARISON WITH THE CHART (See EVAL RPT., Sec. 0)

This survey was compared in the field to features portrayed on the following charts:

Chart	Scale	Edition Number	Date	Datum
17316	1:77,812	18 th	July 18, 1998	NAD 83
17300	1:209,978	27 th	August 14, 1993	NAD 83

✓
✓

Present survey soundings were in general agreement with depths from charts 17316 and 17300, except as noted below. In most instances in which differences were noted, present survey soundings were generally shallower than charted soundings. *CONCUR*.

Significant discrepancies were noted particularly in the southern end of Saginaw Channel. This includes the shoal area NW of Symonds Point at the lower end of Saginaw Channel which had discrepancies of 5 fathoms, including two Dangers To Navigation (DTON) which are discussed below. Additionally, a 19 fathom shoal found at 58°22'04"N, 134°52'0"W and a 19.4 fathom sounding found at 58°22'09"N, 134°51'57"W, are near a charted 34 fathom sounding approximately 1000 meters south of Favorite Reef. In this same location the charted 17 fathom sounding is approximately 300 meters west from the location of the 17 fathom sounding found during this survey. *Compare* Figure 8 below illustrates this discrepancy:

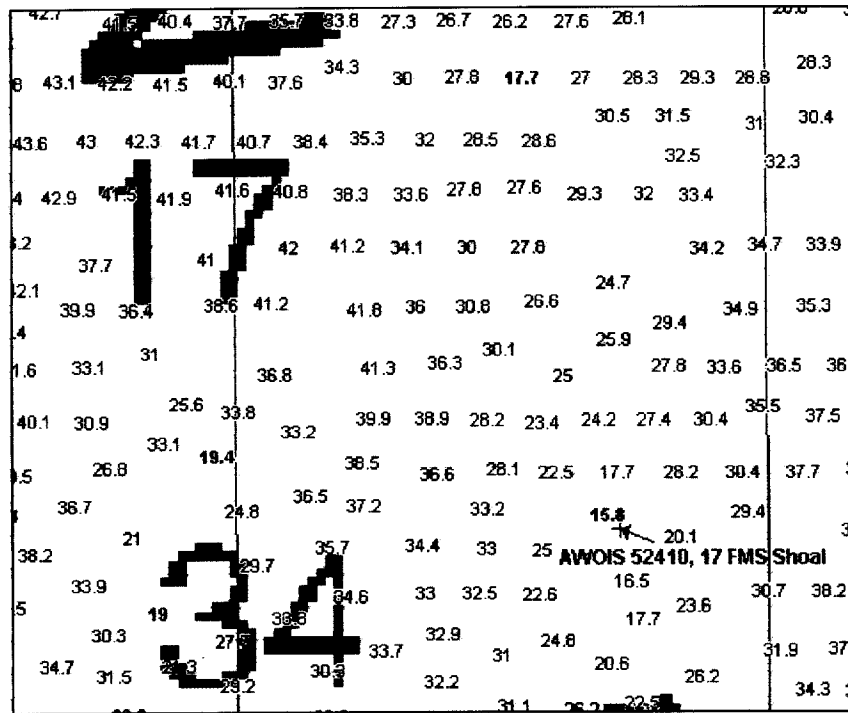


Figure 8 – Chart 17316 Sounding Discrepancies

Non-sounding features are discussed in Section J. Final sounding comparisons will be made at PHB after application of approved tides.

Dangers to Navigation

Two Danger to Navigation (DTON) reports were submitted to the Seventeenth Coast Guard District. The first, dated 13 June, 1999, included five DTONs discovered during preliminary processing of survey H10870. Copies of this first DTON Report are included in ^{This report} Appendix I, and are addressed below.

A 10.7 fathom shoal sounding (submitted as a 10 3/4 fathom shoal) was found at 58°25'24.880"N, 134°55'59.271"W (Pos. #24865). The nearest charted sounding is 13 fathoms. *(Superseded by the second DTON report dated Sept. 10, 1999)*

A 6.8 fathom shoal sounding (submitted as a 6 3/4 fathom shoal) was found at 58°24'09.722"N, 134°52'39.130"W (Pos. #52663). The nearest charted sounding is 19 fathoms. *(Superseded by the second DTON report dated Sept. 10, 1999)*

✓ A 4.7 fathom shoal sounding (submitted as a 4 3/4 fathom shoal) was found at 58°23'14.373"N, 134°51'53.168"W (Pos. #22975). The nearest charted sounding is 10 fathoms.

A ⁵6.8 fathom shoal sounding (submitted as a 6 3/4 fathom shoal) was found at 58°21'10.318"N, 134°51'20.371"W (Pos. #52556). The nearest charted sounding is 17 fathoms.

✓ A 9.3 fathom shoal sounding (submitted as a 9 1/4 fathom shoal) was found at 58°20'58.510"N, 134°50'44.181"W (Pos. #22272). The nearest charted sounding is 14 fathoms.

The second DTON Report was submitted upon further processing and investigation of survey H10870. The following ⁵DTONs were discovered and submitted to the Seventeenth Coast Guard District. Refer to the DTON Report in ^{attached} Appendix I for additional information. *(Report dated September 10, 1999)*

²

A 7.7 fathom shoal sounding (submitted as a 7 ¼ fathom shoal) was found at 58°25'19.11"N, 134°55'57.13"W (Pos. #73642). The nearest charted sounding is 13 fathoms. This shoal sounding is near the 10.7 fathom shoal located at 58°25'24.88"N, 134°55'59.27"W submitted in the first DTON letter referenced above, and should supercede it. *CONCUR*.

✓A 9.8 fathom shoal sounding (submitted as a 9 ¾ fathom shoal) was found at 58°24'45.4"N, 134°57'14.08"W (Pos. #81101). The nearest charted sounding is 14 fathoms.

¹

A 9.7 fathom shoal sounding (submitted as a 9 ½ fathom shoal) was found at 58°24'44.64"N, 134°57'14.35"W (Pos. #35347). The nearest charted sounding is 34 fathoms.

³

An 8.4 fathom shoal sounding (submitted as a 8 ¼ fathom shoal) was found at 58°24'41.98"N, 134°52'38.47"W (Pos. #70860). The nearest charted sounding is 14 fathoms.

✓A 7 fathom shoal sounding (submitted as a 7 fathom shoal) was found at 58°24'09.72"N, 134°52'39.13"W (Pos. #52663). The nearest charted sounding is 19 fathoms.

¹

A 5.2 fathom shoal sounding (submitted as a 5 fathom shoal) was found at 58°23'39.04"N, 134°51'56.36"W (Pos. #74069). The nearest charted sounding is 7 fathoms.

⁵

A 3.7 fathom shoal sounding (submitted as a 3 ½ fathom shoal) was found at 58°23'17.07"N, 134°51'56.7"W (Pos. #73612). The nearest charted sounding is 14 fathoms.

⁸

A 4.8 fathom shoal sounding (submitted as a 4 ¾ fathom shoal) was found at 58°22'13.25"N, 134°50'39.28"W (Pos. #50145). The nearest charted sounding is 16 fathoms.

✓An 11.1 fathom shoal sounding (submitted as a 11 fathom shoal) was found at 58°21'27.32"N, 134°51'20.27"W (Pos. #60587). This sounding lies between charted 14 and 27 fathom depths.

A 6.5 fathom shoal sounding (submitted as a 6 ½ fathom shoal) was found at 58°21'09.33"N, 134°51'19.86"W (Pos. #86533). The nearest charted sounding is 17 fathoms. This shoal sounding is near the 6.8 fathom shoal located at 58°24'09.72"N, 134°52'39.13"W submitted in the first DTON letter referenced above, and should supercede it. *21'09.23 51'19.86 CONCUR*.

✓A 4.8 fathom shoal sounding (submitted as a 4 ¾ fathom shoal) was found at 58°20'58.46"N, 134°51'30.65"W (Pos. #88063). The nearest charted sounding is 7 fathoms.

⁴

A 4.3 fathom shoal sounding (submitted as a 4 ½ fathom shoal) was found at 58°20'52.75"N, 134°50'53.81"W (Pos. #79735). The nearest charted sounding is 14 fathoms.

A 4¹ fathom shoal sounding (submitted as a 4 fathom shoal) was found at 58°20'44.61"N, 134°50'59.23"W (Pos. #80548). The nearest charted sounding is 6 ¾ fathoms.

⁶

A 2.7 fathom shoal (submitted as a 2 ½ shoal) was found at 58°22'09.36"N, 134°49'48.59"W (Pos. #79705). This feature is located in Adams Anchorage offshore of the charted 3 fathom curve.

A -¾ fathom rock (submitted as a rock awash) was found at 58°22'44.76"N, 134°51'25.90"W (Pos. #50318) approximately 200 meters SE of Favorite Reef. *Shown as *(6) on smooth sheet.*

A -¼ fathom rock (submitted as a rock awash) was found at 58°20'41.16"N, 134°53'53.84"W (Pos. #29008) approximately 200 meters offshore along the western side of Barlow Cove. *Shown as *(1) on smooth sheet.*

O. ADEQUACY OF SURVEY (See EVAL RPT., Sec. P)

Survey H10870 is complete and adequate to supersede prior soundings and features in their common areas. *CONCUR*

P. AIDS TO NAVIGATION

Two non-floating aids to navigation were positioned on survey H10870 using static GPS. Favorite Reef Light 2 (Light List # 23945, Fl R 4 sec., 5 M) was positioned on DN 155 and Point Retreat Light (Light List # 23955, Fl W 6 sec., 9 M) was positioned on DN 153. These light characteristics are charted adequately on chart 17316 and 17300. ^{*concur*} Additional information is ^{*included in*} ~~contained in~~ Appendix H of this report.

One floating aid to navigation was positioned using DGPS on DN 141:

Light List # 23950

Faust Rock Lighted Bell Buoy FR

Characteristics: Fl 2+1 R, 6 sec., 4 M

Charted Position: 58°25'05.1"N, 134°55'40.6"W

Surveyed Position: 58°25'04.8"N, 134°55'39.1"W

The buoy is charted adequately. ^{*concur*} Additionally, the aid adequately serves its purpose, ^{*concur*} which demarcates the location of Faust Rock, which has a least depth of 2.8 fathoms. The aid is maintained by the USCG.

Q. STATISTICS ✓

Statistics are listed in the Survey Information Summary included with this report.

R. MISCELLANEOUS ✓

This survey area experiences a fairly heavy amount of vessel traffic, especially in the summer months, with cruise ships, ferries, tugs with barges, sight-seeing vessels and small sport fishing boats representing the majority of this traffic. ✓

Bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. ✓

S. RECOMMENDATIONS ✓

Because photogrammetric shoreline was not provided for the entire survey area, the Hydrographer recommends that the charted shoreline be updated with shoreline detail from survey H10870. Precise, low-water shoreline information is imperative when conducting basic hydrographic surveys along the complex Alaska coast. When shoreline manuscripts are not provided, significant extra effort is required to adequately delineate the shoreline and its features. *CONCUR*

The Hydrographer recommends removal of the green wire drag tint from the chart in the area ^{*covered by multibeam and*} common with this survey. *CONCUR*

T. REFERRAL TO REPORTS

The following supplemental reports contain additional information relevant to this survey:

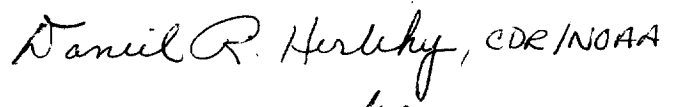
<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-O340-RA Horizontal Control Report	July 1999	N/CS34
Project related data for OPR-O340-RA	July 1999	N/CS34
OPR-O340-RA Coast Pilot Report	July 1999	N/CS26

Respectfully Submitted,



Daniel K. Karlson
 Ensign, NOAA

Approved and Forwarded,



Alan D. Anderson *for*
 Captain, NOAA
 Commanding Officer

Survey Information Summary

Project: Project Name:

Instructions Dated: Project Change Info:

Change #	Dated
1	3/30/98
2	4/12/99
3	5/6/99

Sheet Letter: Registry Number:

Sheet Number:

Survey Title:

Data Acquisition Dates: From: To:

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2120								
2121								
2122	4	3	1		2	2		
2123	2	1						
2124	1	1			2	2		
2125	2		1		2	2	1	
2126		1		1				

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
6		111	186	58/21/18	110-
				134/53/30	
8		120	201	58/22/59	
				134/54/30	
10		139	585	58/14/25	
				134/57/05	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
SEA3	00 hr 00 min	X0.98
SEA3B	000 hr 0 min	X0.97
SEA3C	00 hr 00 min	X0.95
SEA3D	00 hr 00 min	X0.94

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-2318	BARLOW COVE	4/5/99	6/7/99

Statistics Summary

Type	Total:
BS	15
DEV	15.04
DP	45
MBMS	26.77
MBXL	5.31
MS	181.67
S/L	16.63
SPLIT	114.76
SWMB	137.48

Percent XL:

SQNM:

List of Horizontal Control Stations

NAME	STATE	TYPE	LATITUDE	LONGITUDE	SITEID	DEC_LAT	DEC_LON
CURTIS	AK	DGPS Flyaway	58 27.2687N	134 58.7415W	n/a	58.45447833	134.97902500
GUSTAVUS	AK	USCG Beacon	58 25.1000N	135 41.8000W	892	58.41833333	135.69666667
JOE	AK	DGPS Flyaway	58 40.7343N	134 59.3429W	n/a	58.67890500	134.98904833



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
 1801 Fairview Avenue East
 Seattle, Washington 98102-3767

NOAA Ship RAINIER
 September 10, 1999

Commander (mon)
 Seventeenth Coast Guard District
 Post Office Box 25517
 Juneau, Alaska 99802-5517

**ADVANCE
 INFORMATION**

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic survey H10870 in Saginaw Channel and Bartlett Cove, Alaska, during April - June 1999. The dangers are shown graphically on the attached chartlets.

The following dangers to navigation affect the following charts:

Chart	Scale	Edition	Date
17316	1:80,000	18 th	July 18, 1998
17300	1:209,978	27 th	August 14, 1993

The positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Depth (m)
Shoal	9 ¾	58°24'45.40"	134°57'14.08"	18.0
Shoal	8 ¼	58°24'41.98"	134°52'38.47"	15.5
Shoal	9 ½	58°24'44.64"	134°57'14.35"	17.7
Shoal	7	58°24'03.83"	134°52'35.53"	12.9
Shoal	5	58°23'39.04"	134°51'56.36"	9.6
Shoal	3 ½	58°23'17.07"	134°51'56.7"	6.8
Shoal	4 ¾	58°22'13.25"	134°50'39.28"	9.0
Shoal	11	58°21'27.32"	134°51'20.27"	20.4
Shoal	4 ¾	58°22'13.25"	134°50'39.28"	8.8
Shoal	4 ½	58°20'52.75"	134°50'53.81"	8.2
Shoal	4	58°20'44.61"	134°50'59.23"	7.4
Shoal	2 ½	58°22'09.36"	134°49'48.59"	4.9
Rock	Awash	58°22'44.76"	134°51'25.90"	-
Rock	Awash	58°20'41.16"	134°53'53.84"	-

Additionally, the following items supercede items from a Danger to Navigation Letter dated June 13, 1999 which referenced this survey. These items were identified during further processing of hydrographic survey data as shoaler than previously submitted items.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Depth (m)
Shoal	6 ½	58°21'09.33"	134°51'19.86"	6.5
Shoal	7 ¼	58°25'19.11"	134°55'57.13"	13.4



This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-P342-RA-99 and Danger to Navigation message RA-12-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

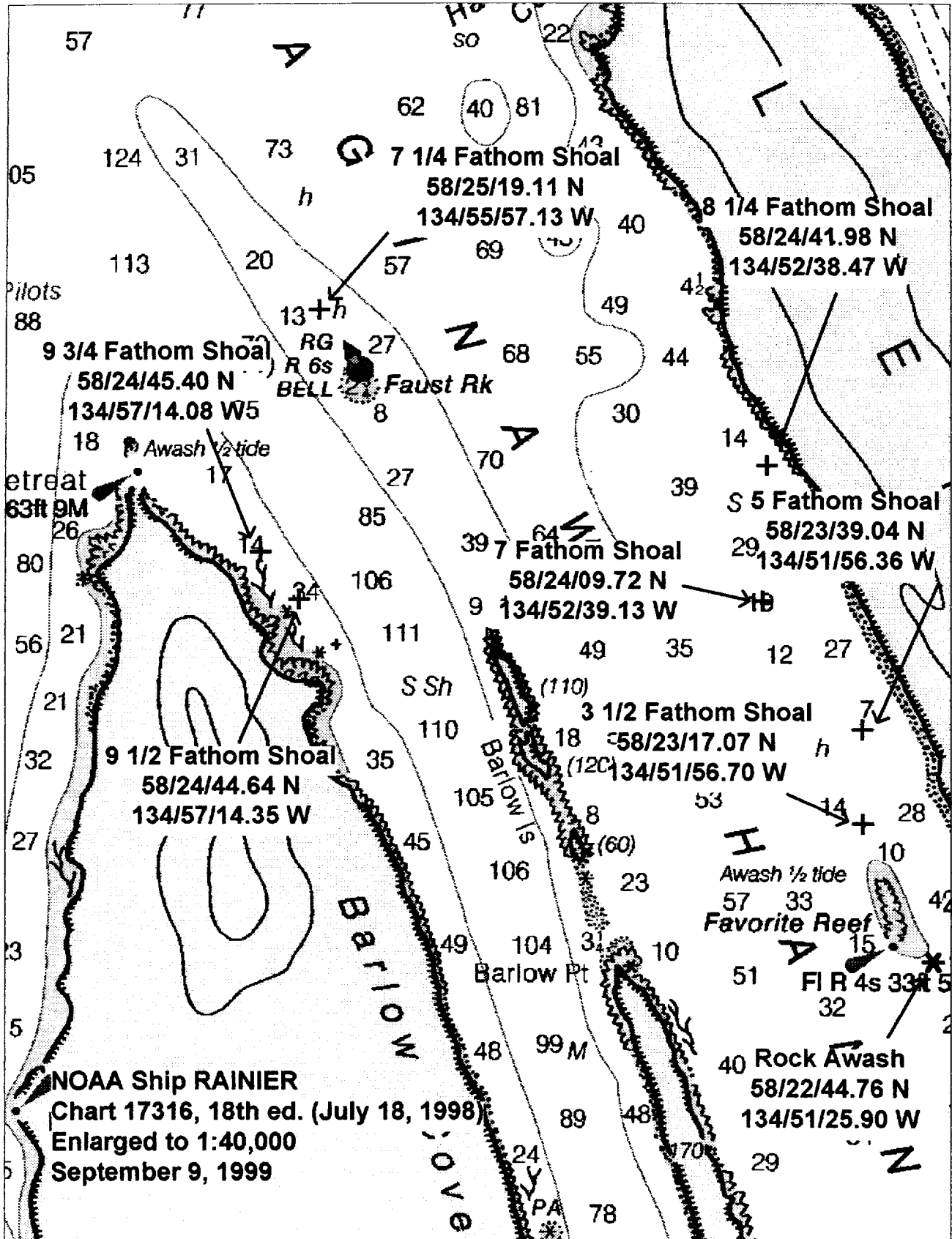
Sincerely,



Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

Cc: NIMA
PMC
N/CS261
N/CS34





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

NOAA Ship RAINIER
June 13, 1998

Commander (mon)
Seventeenth Coast Guard District
Post Office Box 25517
Juneau, Alaska 99802-5517

ADVANCE INFORMATION

Dear CDR Hamblett:

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic surveys in Lynn Canal, southeast Alaska. The dangers are shown graphically on the attached chartlets and are listed below by chart without duplication. The following dangers to navigation affect chart 17300, 28th edition, 1998, 1:209,978, chart 17316, 18th edition, 1998, 1:80,000 and chart 17316 inset, 1:20,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
Shoal	4-1/4	58:48:00.774	135:06:16.368	70244	7.7	H-10864
Shoal	2-1/2	58:35:34.920	135:01:22.697	71066	4.5	H-10862
Shoal	1	58:38:05.634	134:57:05.888	72344	2.1	H-10862
Shoal	7-3/4	58:34:27.884	135:08:13.734	30239	14.1	H-10869
Shoal	4	58:35:25.707	135:10:57.640	50627	7.3	H-10869
Shoal	10	58:35:06.281	135:10:51.786	50867	18.3	H-10869
Shoal	5-1/2	58:36:33.748	135:09:53.122	32929	10.1	H-10869
Shoal	10-3/4	58:32:21.215	134:56:39.068	81722	19.9	H-10866
Shoal	5-1/2	58:33:15.011	134:52:45.735	90233	10.2	H-10866
Reef Awash	-1/2	58:27:24.022	134:54:49.679	21701	-0.8	H-10865
Reef Awash	-3/4	58:29:33.511	134:55:35.116	21852	-1.5	H-10865
Ledge Awash	-1/2	58:29:02.271	134:57:03.555	51386	-0.5	H-10865
Shoal	6-3/4	58:21:10.318	134:51:20.371	52556	12.5	H-10870
Shoal	9-1/4	58:20:58.510	134:50:44.181	22272	16.8	H-10870
Shoal	6-3/4	58:24:09.722	134:52:39.130	52663	12.5	H-10870
Shoal	10-3/4	58:25:24.880	134:55:59.271	24865	19.8	H-10870
Shoal	4-3/4	58:23:14.373	134:51:53.168	22975	8.5	H-10870

The following dangers to navigation affect chart 17316, 18th edition, 1998, Funter Bay inset, 1:20,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

<u>Feature</u>	<u>Depth (fm)</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>	<u>Position #</u>	<u>Depth (m)</u>	<u>Survey #</u>
Shoal	4	58:15:19.824	134:55:54.210	4442	7.2	H-10879
Shoal	2-1/2	58:13:41.092	134:55:21.337	40920	4.5	H-10879
Shoal	2-1/2	58:14:41.896	134:55:42.686	3650	4.5	H-10879
Shoal	3-1/4	58:14:45.416	134:55:47.303	4619	6.1	H-10879
Shoal	4	58:15:09.439	134:55:49.519	3015	7.5	H-10879
Shoal	6-1/2	58:14:34.097	134:54:59.502	2349	11.9	H-10879
Shoal	5	58:14:25.285	134:53:51.867	2884	9.3	H-10879
Shoal	3-1/4	58:14:47.757	134:53:47.436	50683	6.0	H-10879



This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-O340-RA-99 and Danger to Navigation message RA-06-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

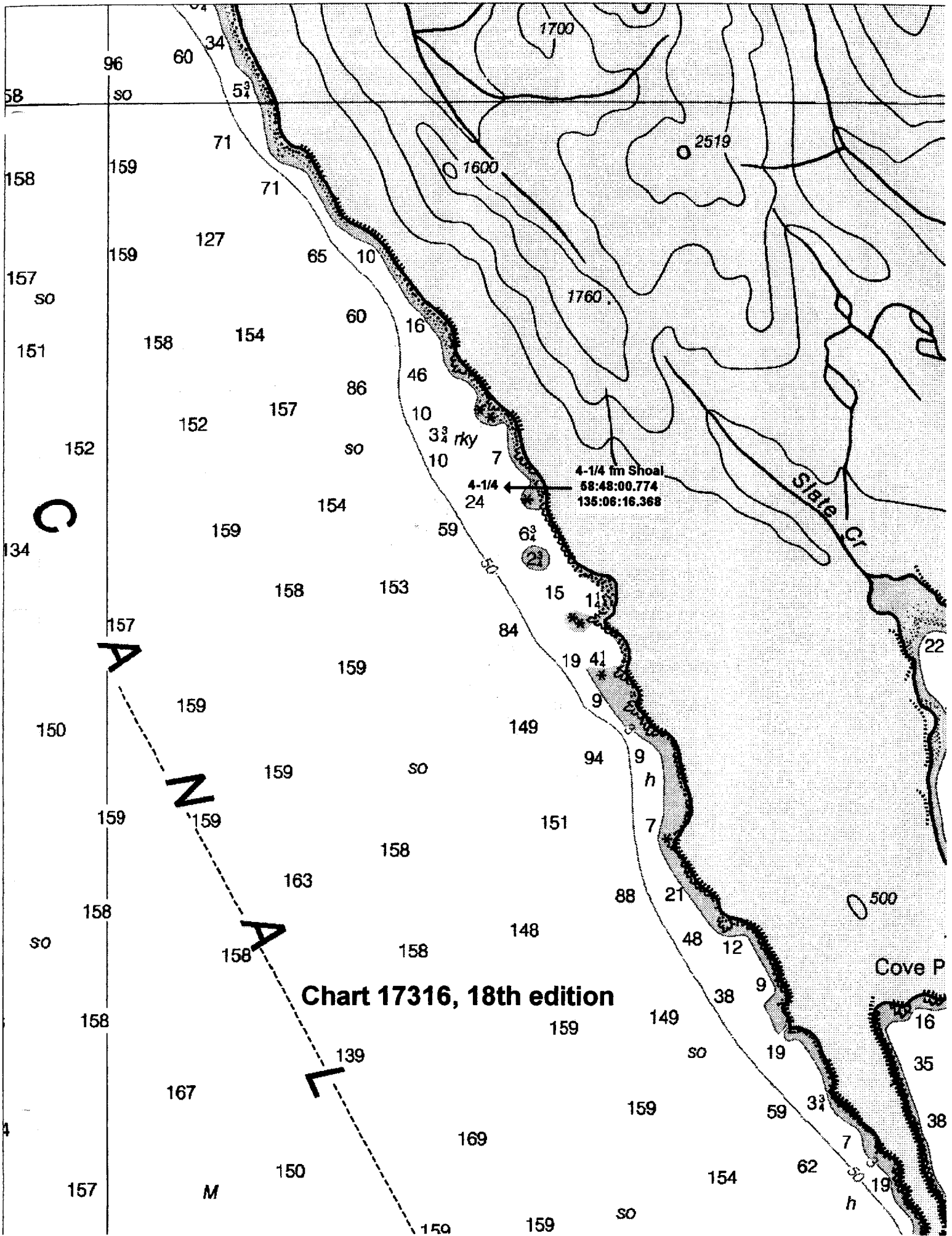
Sincerely,

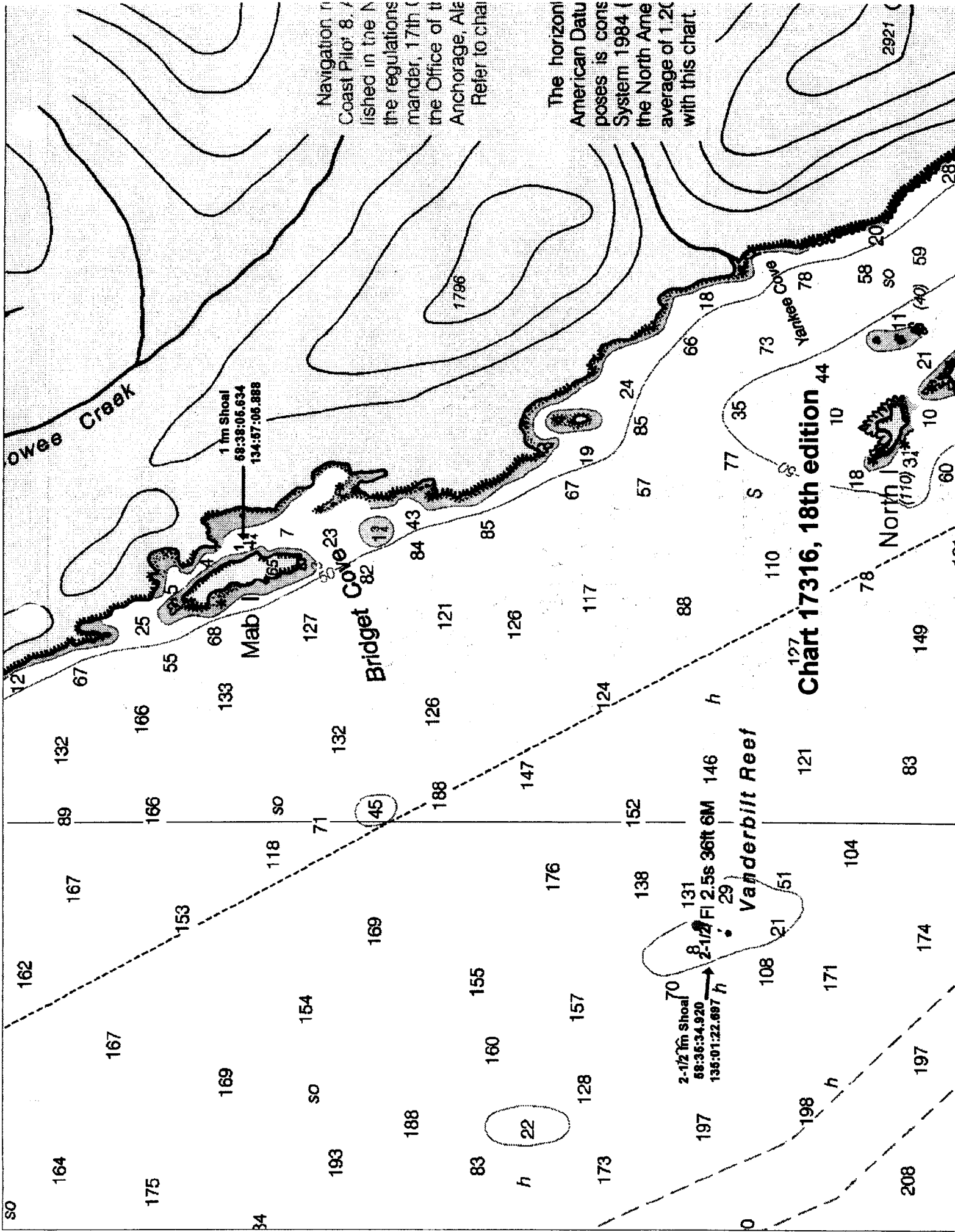


Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachments

cc: NIMA
PMC
N/CS261
N/CS34





Navigation in
Coast Pilot 8.7
published in the N
the regulations
mandar, 17th (t
the Office of th
Anchorage, Ale
Refer to char

The horizon
American Datu
poses is cons
System 1984 (t
the North Ame
average of 1.2
with this chart.

Chart 17316, 18th edition

Owee Creek

1 m Shoal
68:38:06.634
134:57:06.888

Mab I.

Bridget Cove

Vanderbilt Reef

North I.
(110) 31

Yankee Cove

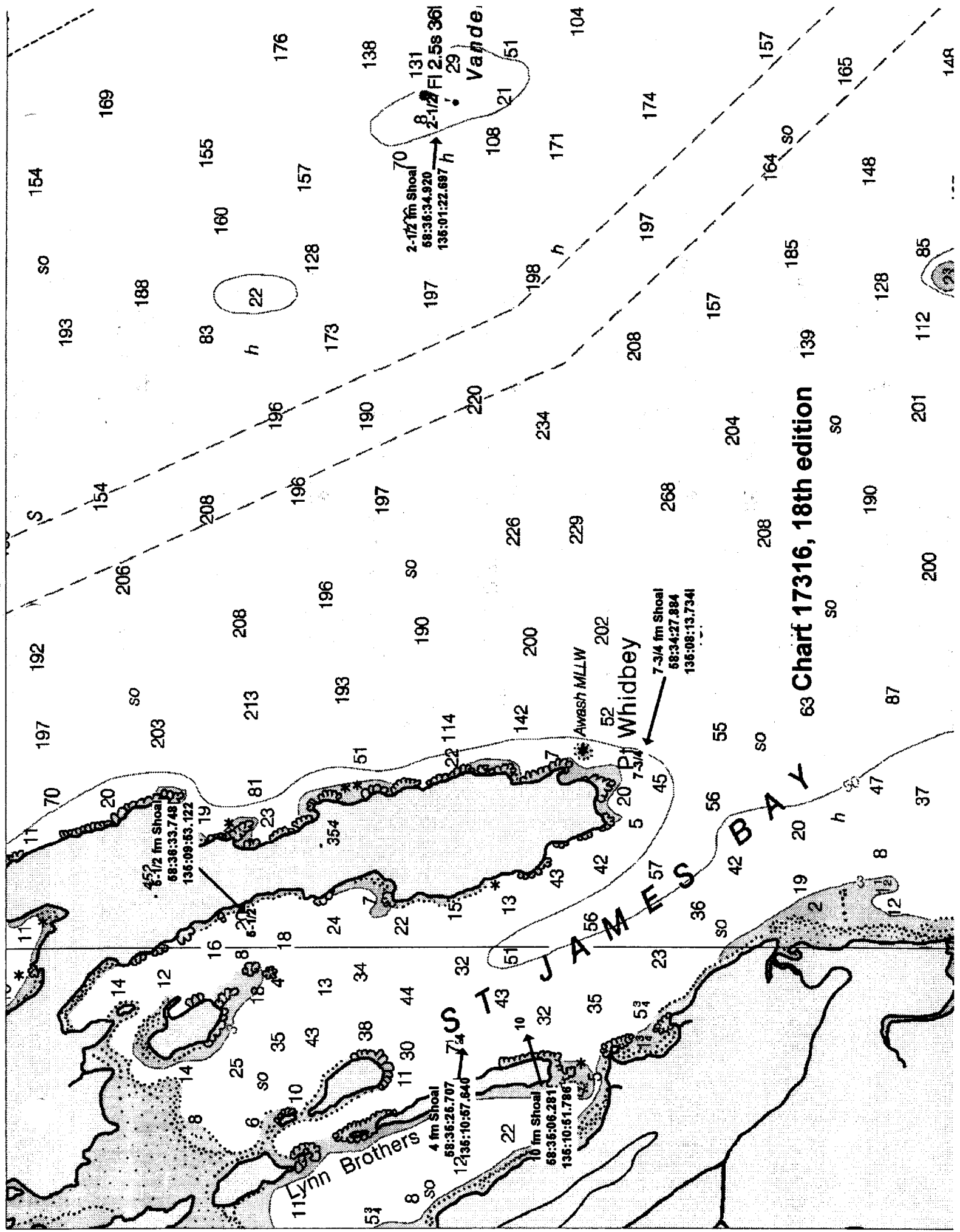


Chart 17316, 18th edition

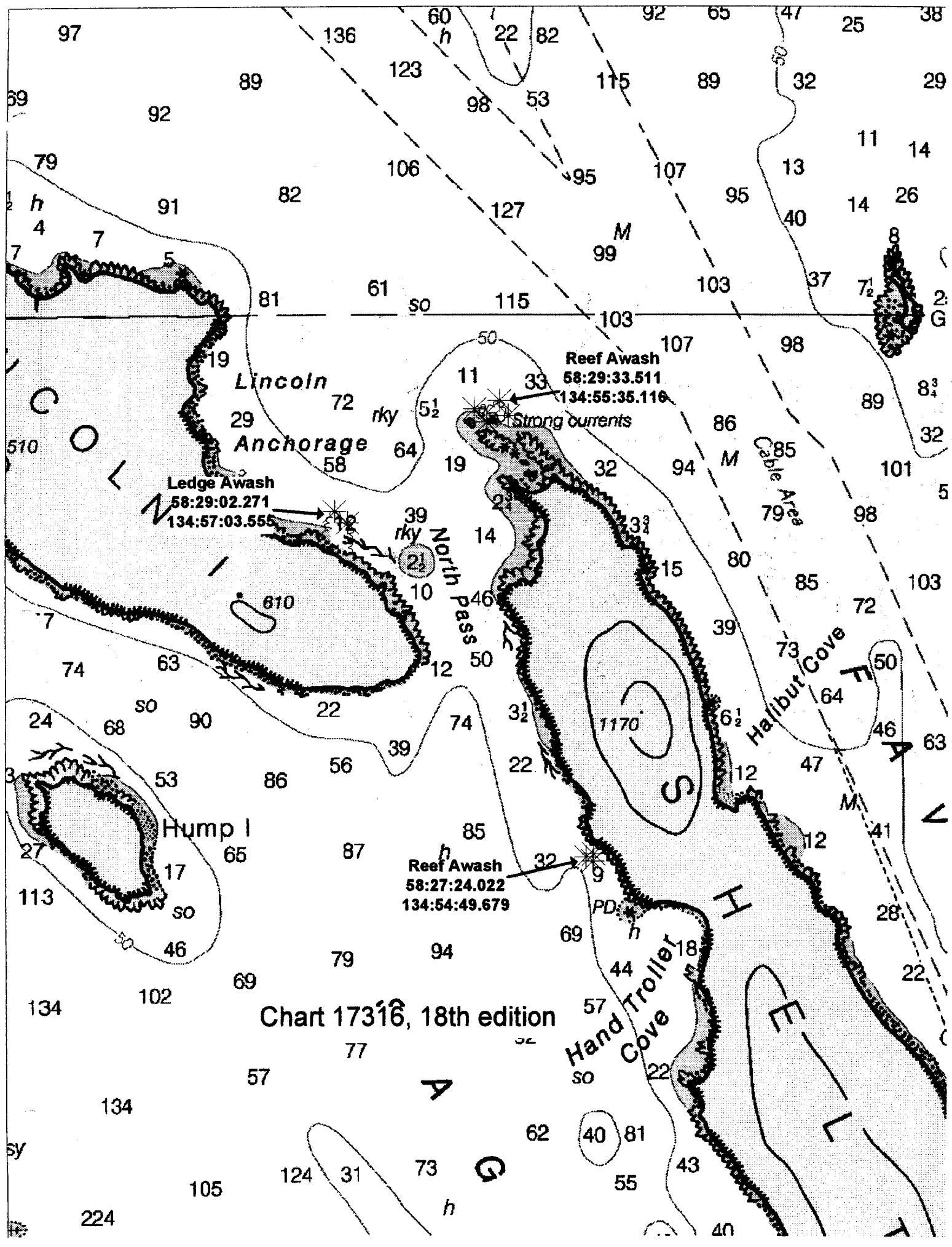


Chart 17316, 18th edition

Hand Troller Cove

Lincoln Anchorage

Ledge Awash
58:29:02.271
134:57:03.555

Reef Awash
58:29:33.511
134:55:35.116

Reef Awash
58:27:24.022
134:54:49.679

COL

S

Halibut Cove

Cable Area

A

G

V

8 3/4

32

103

63

22

81

40

97

136

60 h

22

82

92

65

47

25

38

69

92

89

123

98

53

115

89

32

29

79

91

82

106

127

95

107

95

13

11

14

h
4
7

7

5

81

61

50

115

103

103

37

14

26

8

2: G

Lincoln

Anchorage

Ledge Awash
58:29:02.271
134:57:03.555

Reef Awash
58:29:33.511
134:55:35.116

Strong currents

North Pass

Halibut Cove

Cable Area

Hump I

Reef Awash
58:27:24.022
134:54:49.679

Hand Troller Cove

Chart 17316, 18th edition

224

105

124

31

73

h

62

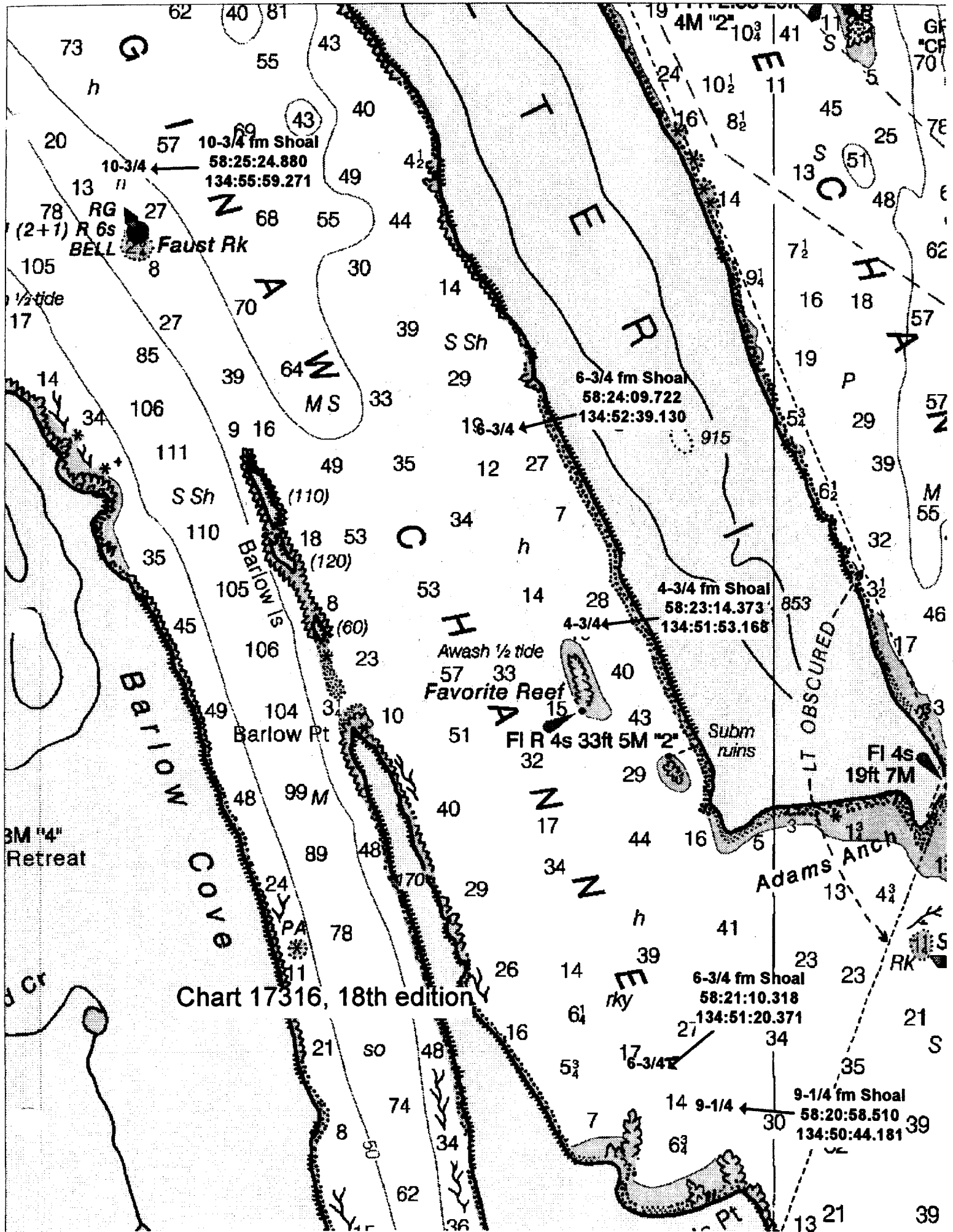
40

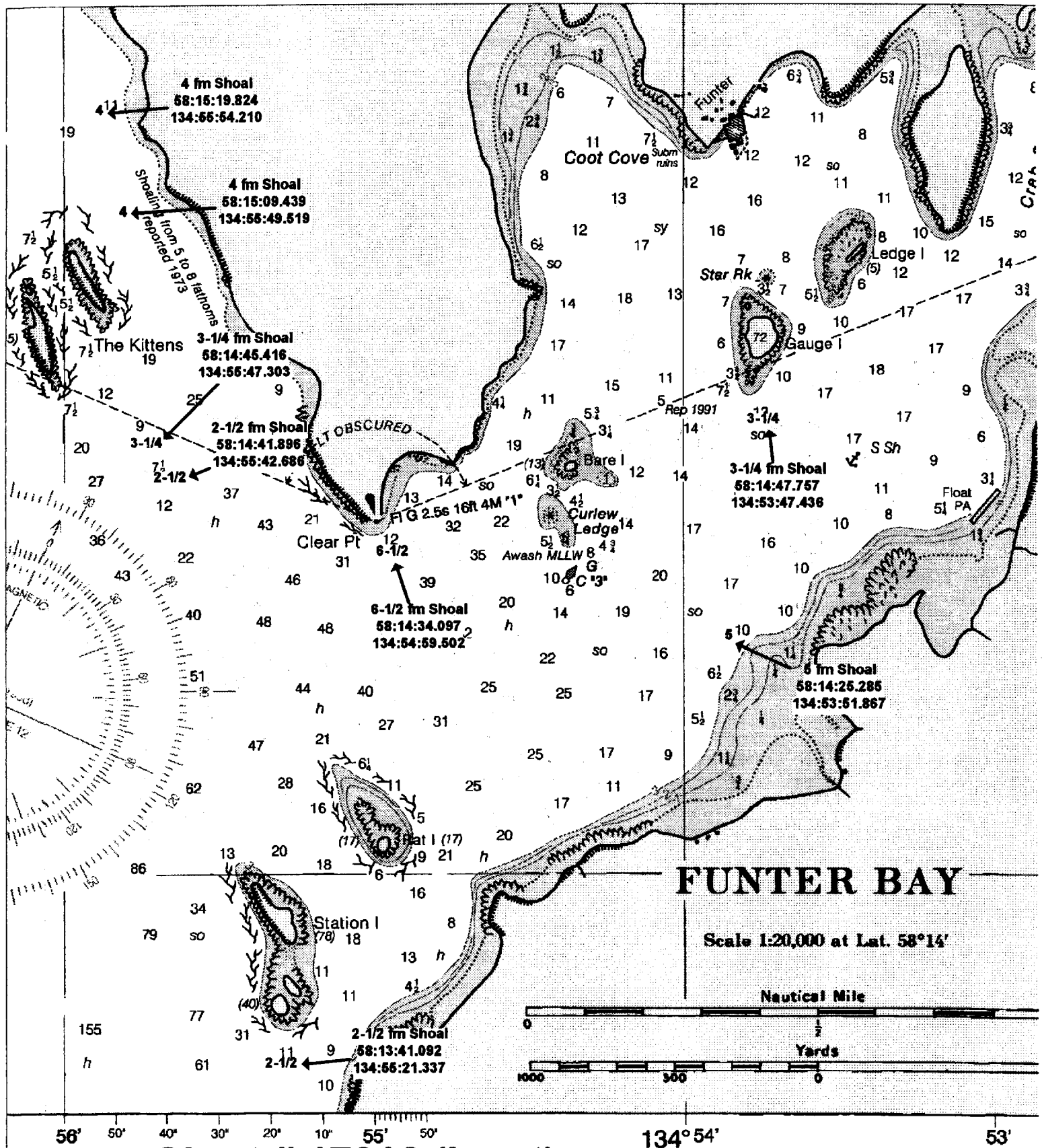
81

55

40

ELL





77

14

ADVANCE INFORMATION

It is requested that the following dangers to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned these features while conducting hydrographic surveys in Lynn Canal, southeast Alaska. The dangers are listed below by chart without duplication. The following dangers to navigation affect chart 17300, 28th edition, 1998, 1:209,978, and chart 17316, 18th edition, 1998, 1:80,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
Shoal	4-1/4	58:48:00.774	135:06:16.368	70244	7.7	H-10864
Shoal	2-1/2	58:35:34.920	135:01:22.697	71066	4.5	H-10862
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Reef Awash	-1/2	58:27:24.022	134:54:49.679	21701	-0.8	H-10865
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Ledge Awash	-1/2	58:29:02.271	134:57:03.555	51386	-0.5	H-10865
Shoal	6-3/4	58:21:10.318	134:51:20.371	52556	12.5	H-10870
Shoal	9-1/4	58:20:58.510	134:50:44.181	22272	16.8	H-10870
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Shoal	10-3/4	58:25:24.880	134:55:59.271	24865	19.8	H-10870
Shoal	4-3/4	58:23:14.373	134:51:53.168	22975	8.5	H-10870

H-10870

The following dangers to navigation affect chart 17316, 18th edition, 1998, Funter Bay inset, 1:20,000. All positions are on the NAD 83 datum and depths have been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
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Shoal	3-1/4	58:14:47.757	134:53:47.436	50683	6.0	H-10879

This is advance information subject to office review. Questions concerning this letter should be directed to the Chief, Pacific Hydrographic Branch, (206) 526-6835. Refer to survey project OPR-O340-RA-99 and Danger to Navigation message RA-06-99. More information on current RAINIER survey projects may be obtained by e-mail; contact the Field Operations Officer at FOO.RAINIER@NOAA.GOV.

/signed/

Alan D. Anderson
Captain, NOAA
Commanding Officer

Section P: Descriptive Report Insert

Name of Aid: Favorite Reef Light 2
Light List #: 23945

Method of Positioning Static GPS: DGPS: Other: _____

Positioning Information

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	58/22/48.17	134/51/43.75
Survey Pos.	58/22/47.84	134/51/41.08

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	508061.5	6471031.5
Survey Pos.	508104.9	6471021.4

Difference between Charted and Surveyed Position: Distance: 45 meters
(Bearing from Surveyed to Charted Position) Bearing: 283 deg T

Characteristics

Do characteristics match Light List? Yes No

If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes No

If no, why not? _____

New/Uncharted Aids (if information is known or easily obtained)

Date Est: _____

Maintained By: _____

Private? Yes No

Is aid seasonally maintained? Yes No

Frequency of Maintenance: _____

Apparent Purpose: _____

Other Information:

Additional information is contained in the Horizontal Control Report for OPR-O340-RA-99.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
Pacific Marine Center
1801 Fairview Avenue East
Seattle, Washington 98102-3767

NOAA Ship RAINIER
July 21, 1999

MEMORANDUM FOR: CDR James Gardner
Chief, Pacific Hydrographic Branch

THROUGH: RADM Nicholas A. Prahl
Director, Pacific Marine Center .

FROM: *Daniel R. Herlihy*
CDR Daniel R Herlihy
Commanding Officer

SUBJECT: Survey Data Transmittal Delay

There will be a delay in the transmission of survey data for projects OPR-O340-RA-99 and OPR-O351-RA-99. The transmission of data will exceed four weeks from completion of field work.

The surveys affected are H-10866 (RA-10-4-99), H-10865 (RA-10-5-99), H-10869 (RA-10-6-99), H-10870 (RA-10-7-99), H-10879 (RA-10-8-99), H-10880 (RA-20-3-99), H-10882 (RA-20-4-99), H-10883 (RA-10-9-99), F-00451 (RA-10-10-99), and H-10902 (RA-10-11-99). There are numerous reasons for this delay including, but not limited to, use of untested software for the acquisition of data, lack of experienced personnel, and the need to efficiently use the vessels as acquisition platforms while processing data already collected. In addition, the Commanding Officer and Field Operations Officer rotated during the summer inport; there was a ramp up period on the above projects to allow for adequate review.

The four week submittal of survey data recommendation noted in the Field Procedures Manual (FPM) does not reflect knowledge of current data acquisition and processing timelines. As you know, the shallow water multibeam (SWMB) systems allow for extremely large data sets to be collected in a very short amount of time. The processing of these data sets takes a much longer amount of time than does the processing of single beam data. In fact, the ratio of time processing SWMB data to time collecting SWMB data is 4:1. In comparison, the ratio of processing single beam data to the collection of single beam data is 1:3. The FPM should be updated to recognize the larger amount of time needed to process SWMB data by the field units. It is recommended that the FPM be changed to allow eight weeks for the submittal of survey data from the date of field work completion.

The anticipated transmittal date for the above mentioned surveys is the beginning of August 1999.



APPROVAL SHEET

for

H10870

RA-10-07-99

Standard field surveying and processing procedures were followed in producing this survey in accordance with the NOS Hydrographic Surveys Specifications and Deliverables; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1998.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved. All records are forwarded for final review and processing to N/CS34, Pacific Hydrographic Branch.

Approved and Forwarded,

Daniel R. Herlihy, CDR/NOAA

Alan D. Anderson
Captain, NOAA
Commanding Officer
NOAA Ship RAINIER

for

GEOGRAPHIC NAMES

H-10870

Name on Survey	A <i>PN CHART NO. 17300-17316</i> B <i>ON PREVIOUS SURVEY</i> C <i>CON U.S. QUADRANGLE MAPS</i> D <i>FROM LOCAL INFORMATION</i> E <i>ON LOCAL MAPS</i> F <i>P.O. GUIDE OR MAP</i> G <i>RAND McNALLY ATLAS</i> H <i>U.S. LIGHT LIST</i> K										
	A	B	C	D	E	F	G	H	K		
ALASKA (title)	X		X							1	
ADAMS ANCHORAGE	X		X							2	
ADMIRALTY ISLAND	X		X							3	
BARLOW COVE	X		X							4	
BARLOW ISLANDS	X		X							5	
BARLOW POINT	X		X							6	
FAUST ROCK	X		X							7	
FAVORITE REEF	X									8	
MANSFIELD PENINSULA	X		X							9	
RETREAT, POINT	X		X							10	
SAGINAW CHANNEL	X		X							11	
SHELTER ISLAND	X		X							12	
SYMONDS POINT	X		X							13	
										14	
										15	
										16	
										17	
										18	
										19	
										20	
										21	
										22	
										23	
										24	
										25	

Dennis J. Rosenberg
FEB 22 2000



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 6, 1999

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0340-RA
HYDROGRAPHIC SHEET: H-10870

LOCALITY: Saginaw Channel to Barlow Cove, Lynn Canal, AK
TIME PERIOD: April 20 - June 7, 1999

TIDE STATION USED: 945-2318 Barlow Cove, AK
Lat. 58° 19.3'N Lon. 134° 52.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.509 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA64, SEA83 & SEA84.

Refer to attachments for zoning information.


Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Note 2: Juneau, AK and Skagway, AK were used as datum control for subordinate tide stations and for tidal zoning in this hydrographic survey. Accepted datums for these two stations have been updated recently and have changed significantly from previous values.

The current National Tidal Datum Epoch (NTDE) used to compute tidal datums at tide stations is the 1960-78 NTDE. Traditionally, NTDEs have been adjusted when significant changes in mean sea level (MSL) trends are found through analyses among the stations of the National Water Level Observation Network (NWLON). Epochs are updated to ensure that tidal datums are the most accurate and practical for navigation, surveying and engineering applications and reflect the existing local sea level conditions. For instance, analyses of sea level trends show that a new NTDE is necessary and efforts are underway to update the 1960-78 NTDE to a more recent 19-year time period.

TIDE NOTE FOR HYDROGRAPHIC SURVEY SHEET H-10870 cont.

However, analyses also show that there are several geographic areas which are strongly anomalous from the average sea level trends found across the NWLON and must be treated differently. One of these areas is in southeast Alaska covering the Lynn Canal, Icy Strait, and Glacier Bay region. Juneau and Skagway show relative sea level trends of -0.038 ft/yr and -0.052 ft/yr, respectively due to land emergence from the retreat of glaciers over recent geological time. NOS has adopted a procedure of computing accepted tidal datums for these anomalous regions by using a MSL value calculated from the last several years of data rather than the 19-year NTDE. The accepted range of tide is still based on the 19-year NTDE and, when applied to the updated MSL, will result in updated values for Mean High Water (MHW) and Mean Lower Low Water (MLLW) derived through standard datum calculation procedures. For both Juneau and Skagway, the MSL values were computed from the period of 1994-1998. This resulted in a lowering of the MLLW datums relative to land by -0.40 ft at Juneau and -0.53 ft at Skagway compared to the previous MLLW elevations used in last year's surveys. Subordinate tide stations in the area used for hydrographic surveys and controlled by Juneau or Skagway will be affected similarly. Accepted datums have been computed and may be accessed on the Internet through the URL specification <http://www.co-ops.nos.noaa.gov>.

For 

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-O340-RA-99,
Sheet H-10870.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEA64			
-134.966311 58.366237	9452318	0	1.01
-135.070146 58.355822			
-135.108804 58.389757			
-135.101046 58.434896			
-134.987639 58.456439			
-134.911523 58.459634			
-134.883282 58.448923			
-134.843845 58.379935			
-134.882525 58.362237			
-134.894794 58.378041			
-134.920234 58.377383			
-134.966311 58.366237			
Zone SEA83			
-134.920234 58.377383	9452318	0	1.00
-134.886639 58.299621			
-134.858666 58.314541			
-134.882525 58.362237			
-134.894794 58.378041			
-134.920234 58.377383			
Zone SEA84			
-134.843845 58.379935	9452318	0	1.02
-134.882525 58.362237			
-134.858666 58.314541			
-134.80798 58.321888			
-134.81273 58.375272			
-134.843845 58.379935			

HYDROGRAPHIC SURVEY STATISTICS

H-10870

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

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

SHORELINE DATA

SHORELINE MAPS (List):	GC-10425
PHOTOBATHYMETRIC MAPS (List):	
NOTES TO THE HYDROGRAPHER (List):	
SPECIAL REPORTS (List):	
NAUTICAL CHARTS (List):	17316, 18th Edition, July 18, 1998

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				
POSITIONS REVISED				
SOUNDINGS REVISED (Selected)				
CONTROL STATIONS REVISED			53,659	
	TIME-HOURS			
	VERIFICATION	EVALUATION	TOTALS	
PRE-PROCESSING EXAMINATION				
VERIFICATION OF CONTROL				
VERIFICATION OF POSITIONS				
VERIFICATION OF SOUNDINGS				
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION VERIFICATION				
COMPILATION OF SMOOTH SHEET	248.0		248.0	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		18.0	18.0	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		21.0	21.0	
GEOGRAPHIC NAMES				
OTHER (Chart Compilation)		51.0	51.0	
*USE OTHER SIDE OF FORM FOR REMARKS				
	TOTALS	248.0	30.0	338.0

Pre-processing Examination by R. Davies	Beginning Date 12/16/99	Ending Date 12/16/99
Verification of Field Data by E. Domingo, R. Davies, R. Mayor, G. Nelson, D. Doles	Time (Hours) 248.0	Ending Date 4/4/00
Verification Check by	Time (Hours)	Ending Date
Evaluation and Analysis by I. Almacen	Time (Hours) 39.0	Ending Date 4/6/00
Inspection by D. Hill	Time (Hours) 6	Ending Date 5-23-00

EVALUATION REPORT H-10870

A. PROJECT

Project information is adequately discussed in the hydrographer's report.

B. AREA SURVEYED

The survey area is adequately discussed in the hydrographer's report

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey. Charted features and soundings inshore of this limit line which have not been specifically addressed during survey operations should be retained as charted. Page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of mud, sand and pebbles mixed with broken shells. Depths range from 0 to 124 fathoms.

C. SURVEY VESSELS

Survey vessels are adequately discussed in the hydrographer's report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The acquisition and processing of data in the field has been adequately discussed in the hydrographer's report.

Office processing of survey data was conducted using the same Computer Aided Resource Information System (CARIS), and Hydrographic Processing System (HPS) used by the hydrographer. The smooth sheet was compiled with MicroStation 95.

Digital data for this survey exists in the standard HPS format, a database format using the .dbf extension. In addition, the smooth sheet drawing is filed in the MicroStation format, i.e., dgn extension. Copies of these files have been forwarded to the Hydrographic Surveys Division and a backup copy retained at PHB. Database records forwarded are in the Internal Data Format (IDF) and are in compliance with specifications in existence at the time of survey processing.

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by Hydrographic Survey Guideline No. 35 and No. 75.

The data are plotted using a Universal Transverse Mercator (UTM) projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side scan sonar was not utilized during this survey.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately discussed in the hydrographer's report.

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW) as appropriate, with approved tide correctors obtained from the Center For Operational Oceanographic Products and Services. The approved tide correctors are zoned from Barlow Cove, Alaska, gage 945-2318.

Other sounding reducers include corrections for static draft, dynamic draft, sound velocity, heave, roll and pitch. These reducers have been reviewed and are consistent with NOS specification.

H. CONTROL STATIONS

Control stations have been adequately discussed in the hydrographer's report.

The positions of horizontal control stations used during hydrographic operations are published values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -1.199 seconds (-37.098 meters)
Longitude: 6.469 seconds (105.131 meters)

I. HYDROGRAPHIC POSITION CONTROL

Hydrographic position control has been adequately discussed in the hydrographer's report.

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 for a 1:10,000 scale survey was computed for survey operations. The maximum (HDOP) allowable limit has not been exceeded during this survey and the quality of data obtained is good. During Shallow water multibeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS-MV that combines the DGPS position with inertial navigation information. In the event that the differential GPS corrector signal is lost, the POS-MV will continue to provide positions based on inertial navigation. Data was analyzed during processing to ensure it contains no significant errors. The reference site confirmation test and daily DGPS performance checks were conducted in the field and found adequate.

NAD 83 is used as the horizontal datum for plotting and position computations.

Additional information concerning specific control system type, calibrations and system checks can be found in the hydrographer's report and in the separates related to horizontal position control and correction to position data.

J. SHORELINE

Geographic Cell GC-10425, from mapping project CM-8808 provided by the Coastal Mapping Program was compiled on NAD83 and applies to the survey area. Shoreline drawn on the smooth sheet in black originates from the above digital shoreline information. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet. There were some changes noted to the Mean High Water Line (MHWL) as compared to the presently charted shoreline.

The presently charted shoreline should be revised based on the latest shoreline information and the results of the recent field verification as depicted on the smooth sheet.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10870 junctions with the following surveys.

Survey	Year	Scale	Area
H-10865	1999	1:10,000	Northern Limit
H-10880	1999	1:20,000	Northern Limits
H-10881	1999	1:20,000	Western Limits

The junctions with surveys H-10865, H-10880 and H-10881 are complete and "Joins" notes have been added to the smooth sheet. Comparison is considered good. However, a few soundings were carried forward from the above contemporary surveys to delineate depth curves and portray shoaler information within the junction areas.

M. COMPARISON WITH PRIOR SURVEYS

The present survey was compared to the following prior surveys:

Survey	Year	Scale	Datum
H-1602A	1890	1:40,000	Valdez
H-2056	1890	1:40,000	Valdez
H-2059	1890	1:20,000	Valdez
H-3986WD	1917	1:20,000	Valdez
H-4228WD	1922	1:40,000	NAD 27

The prior surveys H-1602A, H-2056, H-2059, H-3986WD and H-4228WD cover the entire area of the present survey. The legibility of the prior survey digital image files is good and they were adequately registered to the present survey smooth sheet. The registration was accomplished by matching known geographic points between the present and prior survey smooth sheets.

Comparison of depths reveals that the present survey is generally shoaler by 1-3 fathoms for depths up to about 110 fathoms except in areas where significantly shallower depths were found and reported as dangers to navigation. Aside from the natural changes in the area, the differences in depths noted during this survey may be attributed to greater sounding coverage, improved positioning and sounding methods and relative accuracy of the data acquisition methods used in the field. A more thorough coverage of the area utilizing both single beam and the shallow water multibeam (SWMB) system has revealed more significantly shallower depths not detected during the earlier surveys.

Wire-drag surveys H-3986WD and H-4228WD cover the area of the present survey. There are no significant hangs or groundings noted on these prior surveys except an indication of shoaling north of Point Retreat and around the area of Faust Rock. An adequate sounding coverage of the area utilizing the shallow water multibeam system to substantiate the supersession of the prior wire drag information was accomplished during this survey. It is therefore recommended that the charted wire drag green tint depicted within the common area with multibeam coverage be removed from the chart.

Additional information regarding prior survey comparison is found in the hydrographer's report section M.

Survey H-10870 is adequate to supersede the prior surveys within the area of common coverage.

N. ITEM INVESTIGATIONS

AWOIS items 52409 and 52410 were investigated during this survey. The disposition of these features is adequately addressed in section M of the hydrographer's report.

O. COMPARISON WITH CHART

Survey H-10870 was compared with the following chart.

Chart	Edition	Date	Scale	Datum
17316	18th	July 18, 1998	1:80,000	NAD 83

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and from miscellaneous sources. The prior surveys have been adequately addressed in section M and require no further discussion.

The presently charted submerged ruins at latitude 58/22/35N, longitude 134/50/58W, originating from unknown source, were not investigated during this survey. These charted ruins should be retained as charted.

The charted submerged rock at latitude 58/24/02N, longitude 134/55/50W, originating from unknown source was not mentioned in the hydrographer's report. However, the charted location of the feature was adequately covered by multibeam hydrography during this survey. There is no indication of submerged rock or shoaling noted at its charted location. It is therefore recommended that the submerged rock symbol be deleted and the area be charted based on the latest survey information.

Some charted shoreline is depicted with symbolization (Chart No. 1, C3) denoting a steep coast with rock cliffs. The hydrographer failed to verify this condition therefore the shoreline originating with the aforementioned (section J) remote sensing data should be modified with this symbolization.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features. Features from survey H-10870 have been generalized on chart 17316 along the shoreline where applicable.

With the exception of the feature mentioned above, survey H-10870 is adequate to supersede charted hydrography within the common area.

b. Dangers to navigation

Two Dangers to Navigation (DTON) reports for this survey were transmitted to the USCG, NIMA, N/CS261 and N/CS3 on June 13, 1999 and September 10, 1999. A copy of the reports is attached. No additional dangers were found during office processing.

P. ADEQUACY OF SURVEY

The hydrography contained on survey H-10870 is adequate to:

- a. delineate the bottom configuration, determine least depths, and draw the required depth curves;
- b. reveal there are no significant discrepancies or anomalies requiring further investigation; and
- c. show the survey was properly controlled and soundings are correctly plotted.

The hydrographic records and reports received for processing are adequate and conform to the requirements of the Hydrographic Manual, 4th Edition, revised through Change No. 3, the Hydrographic Survey Guidelines, and the Field Procedures Manual, April 1998 Edition.

Q. AIDS TO NAVIGATION

There are two (2) fixed and one (1) floating aids to navigation within the survey area. The locations of these aids were verified using the DGPS positioning system. They were found in good condition and adequately serve their intended purpose.

There were no features of landmark value found within the area of this survey.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

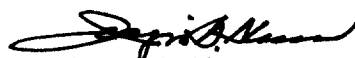
Miscellaneous information is adequately discussed in the hydrographer's report.

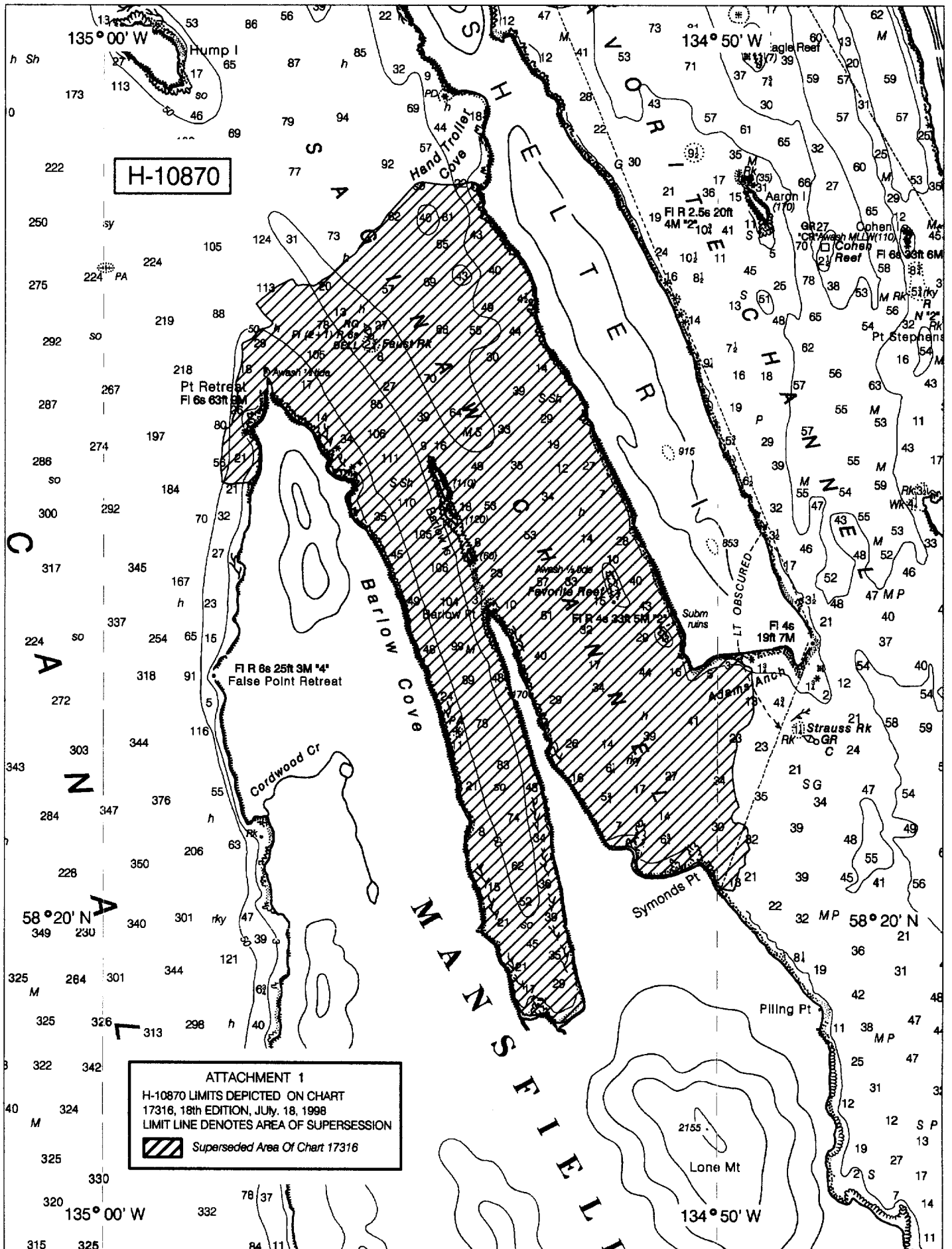
T. RECOMMENDATIONS


Survey H-10870 is an adequate hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS

Referral to reports is adequately discussed in the hydrographer's report.


Isagan A. Almacan
Cartographer

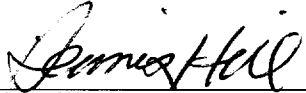


ATTACHMENT 1
 H-10870 LIMITS DEPICTED ON CHART
 17316, 18th EDITION, JULY, 18, 1998
 LIMIT LINE DENOTES AREA OF SUPERSESSION
 Superseded Area Of Chart 17316

APPROVAL SHEET
H-10870

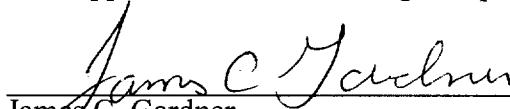
Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of the depth curves, development of critical depths, cartographic symbolization, comparison with prior surveys and verification or disproof of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



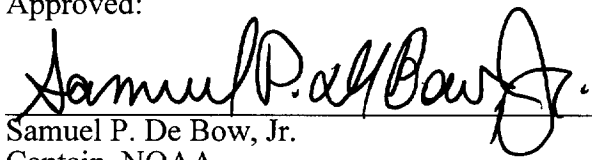
Dennis Hill
Supervisory Cartographer
Pacific Hydrographic Branch
Date: 6-13-00

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.



James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch
Date: 6-15-00

Final Approval

Approved:


Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division
Date: July 23, 2000

