

H10865

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-10-05-99

Registry No. H-10865

LOCALITY

State Alaska

General Locality Lynn Canal

Sublocality Pt. Retreat to Lincoln Island

1999

CHIEF OF PARTY
CAPT A. D. Anderson

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DATE JUL 23 2000

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTER NO. H-10865
HYDROGRAPHIC TITLE SHEET		
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-10-05-99
State <u>Alaska</u>		
General Locality <u>Lynn Canal</u>		
Sublocality <u>Pt. Retreat to Lincoln Island</u>		
Scale <u>1:10,000</u>		Date of Survey <u>April 14 to June 7, 1999</u>
Instructions Date <u>3/5/1998 *</u>		Project No. <u>OPR-O340-RA</u>
Vessel <u>NOAA Ship RAINIER (2120), RA-1 (2121), RA-2 (2122), RA-3 (2123), RA-4 (2124), RA-5 (2125), RA-6 (2126)</u>		
Chief of Party <u>CAPT A.D. Anderson, NOAA</u>		
Surveyed by <u>RAINIER Personnel</u>		
Soundings taken by echo sounder, hand lead, pole <u>Singlebeam: DXF 6000N, KNUDSEN 320M; Intermediate Depth Multibeam: SeaBeam 1050D MKII; Shallow Water Multibeam: Reson SeaBat 8101</u>		
Graphic record checked by <u>RAINIER Personnel</u>		
Evaluation by <u>C. Barry</u>		Automated plot by <u>HP Design Jet 650C</u>
Verification by <u>R. Davies, C. Barry</u>		
Soundings in <u>Fathoms</u> at <u>MLLW</u>		
REMARKS: <u>Time in 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.</u>		
<u>9UGS & SURF 6/12/99 MUR</u>		
All depths listed in this report are referenced to mean lower low water unless otherwise noted.		
* Change No. 1 dated 3/30/98, Change No. 2 dated 4/12/99, Change No. 3 dated 5/6/99		

**NOTE B
CAUTION**
Due to field zoning differences between chart and Adams map, a possible error may exist in some of the charted coverage in this area. The greatest portion of the error would possibly occur in the narrow passages leading to the upper portion of Adams Inlet. The average error recorded is 7 feet. Use chart 17045.

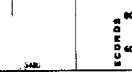
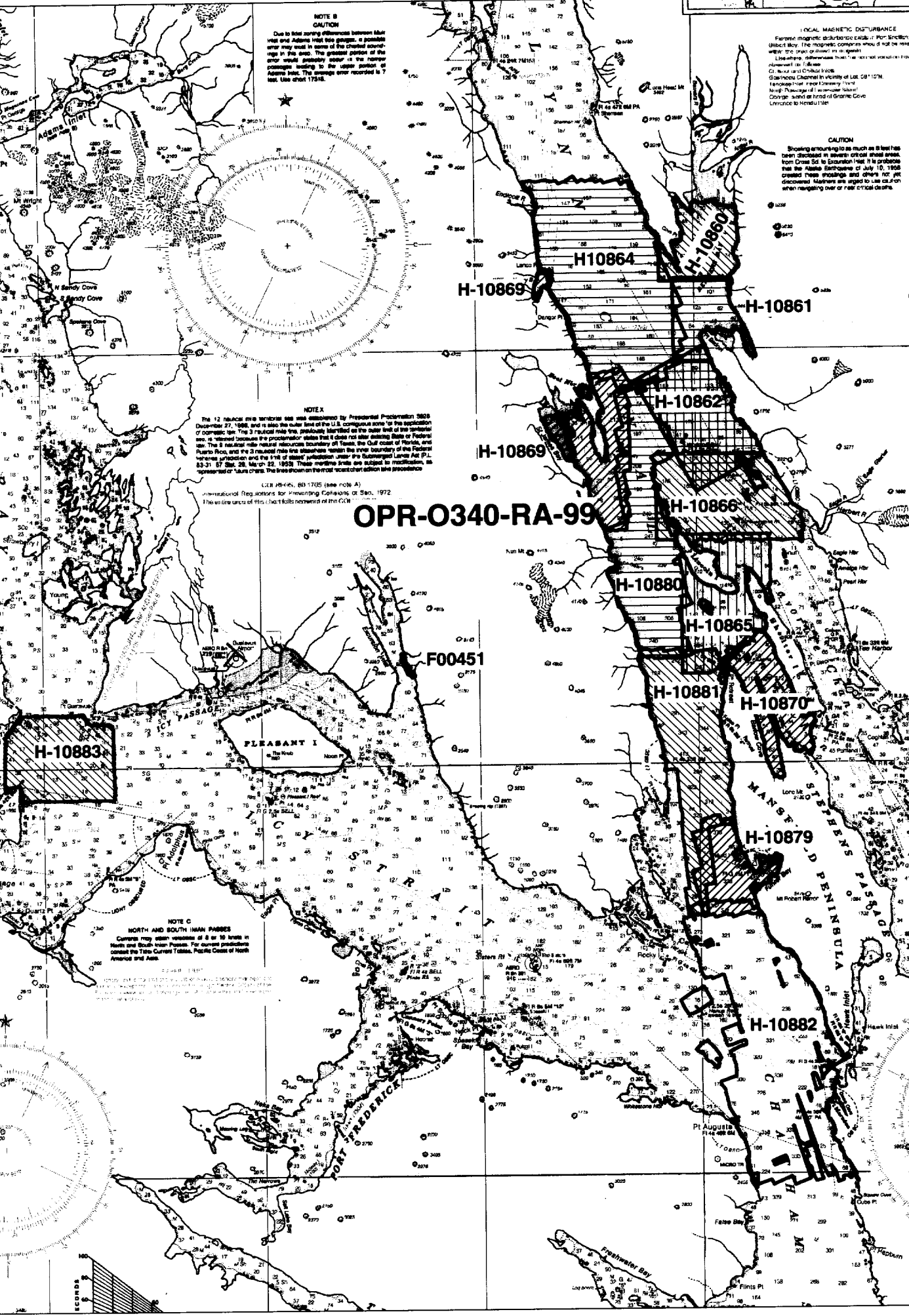
LOCAL MAGNETIC DISTURBANCE
Farmer magnetic disturbance circle: Port Section of Sheet No. 1. The magnetic compass should not be used within the circle or along its diameter.
Lighthouse interference: The light from the lighthouse at Adams Inlet may interfere with the operation of the compass in the vicinity of the lighthouse.
Cape Fear and Channel: The Cape Fear and Channel in the vicinity of Lat. 38° 12' N. Longitude 76° 00' W. are subject to heavy fog. The fog is most dense at the head of Adams Inlet. The fog is most dense at the head of Adams Inlet. The fog is most dense at the head of Adams Inlet.

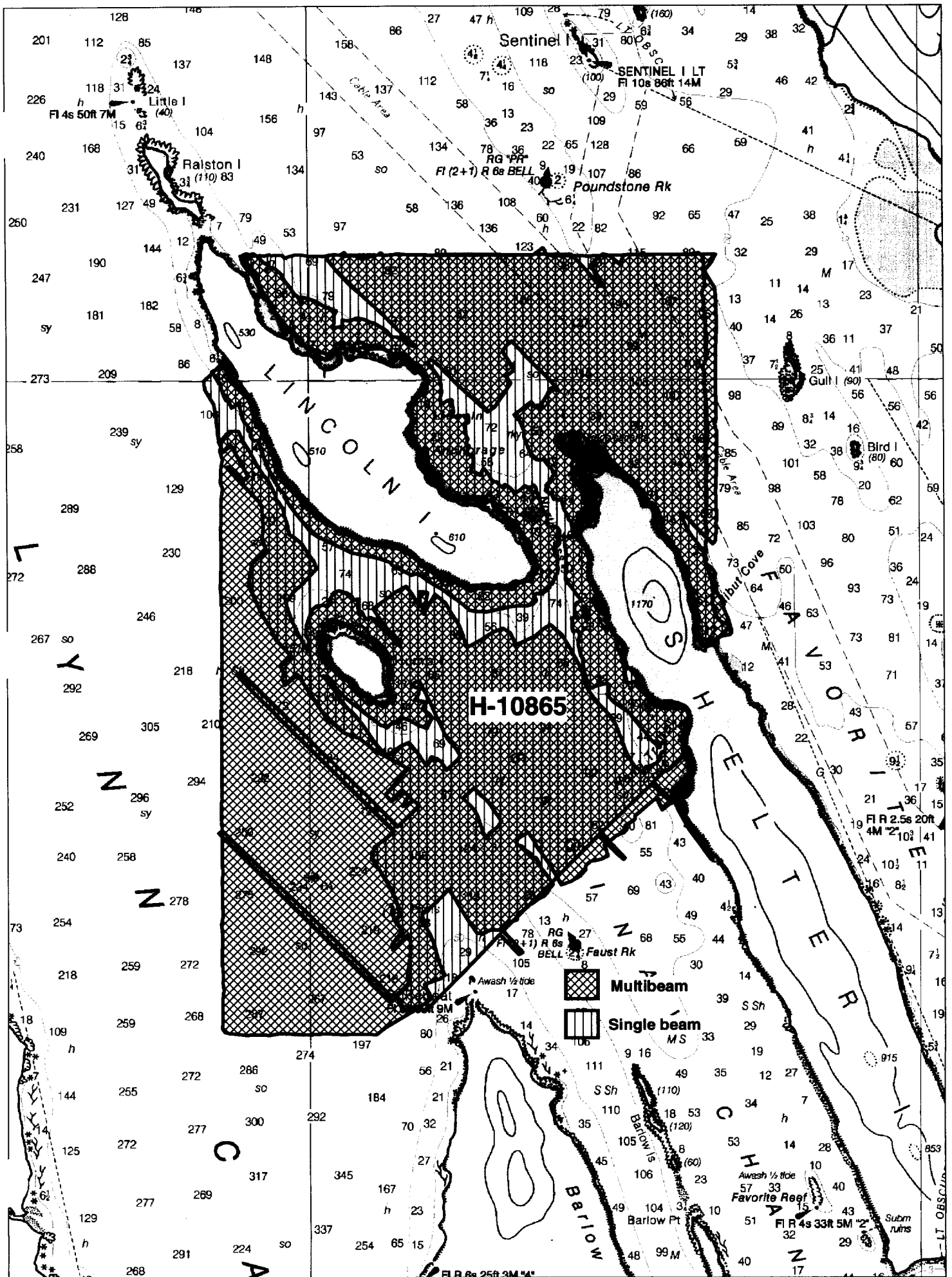
CAUTION
Showing anchorage to as much as 8 feet has been displaced in several critical areas from Cross Sec. to Escutcheon Inlet. It is probable that the Alaska Earthquake of July 10, 1958 created new shoals and others not yet discovered. Mariners are urged to use caution when navigating over or near critical shoals.

NOTE A
The 12 nautical mile territorial sea and contiguous zone of the United States, proclaimed by Presidential Proclamation 3808 December 27, 1958, and is also the outer limit of the U.S. contiguous zone for the application of domestic law. The 3 nautical mile limit, previously identified as the outer limit of the territorial sea, is retained because the proclamation states that it does not alter existing State or Federal law. The 3 nautical mile territorial sea boundary of Texas, the Gulf coast of Florida, and Puerto Rico, and the 3 nautical mile limit elsewhere remain the outer boundary of the Federal contiguous zone and the 12 nautical mile limit elsewhere remain the outer boundary of the Federal territorial sea. These maritime limits are subject to modification, as represented by future charts. The lines shown on this chart indicate actual law precedence.

CGR 85-65, 80-1705 (see note A)
International Regulations for Preventing Collisions at Sea, 1972
The entire area of this chart falls within the CGC

OPR-O340-RA-99





PROGRESS SKETCH

May, 1999
 OPR-0340-RA-99
 Lynn Canal, Alaska

Capt. A. D. Anderson
 COMMANDING

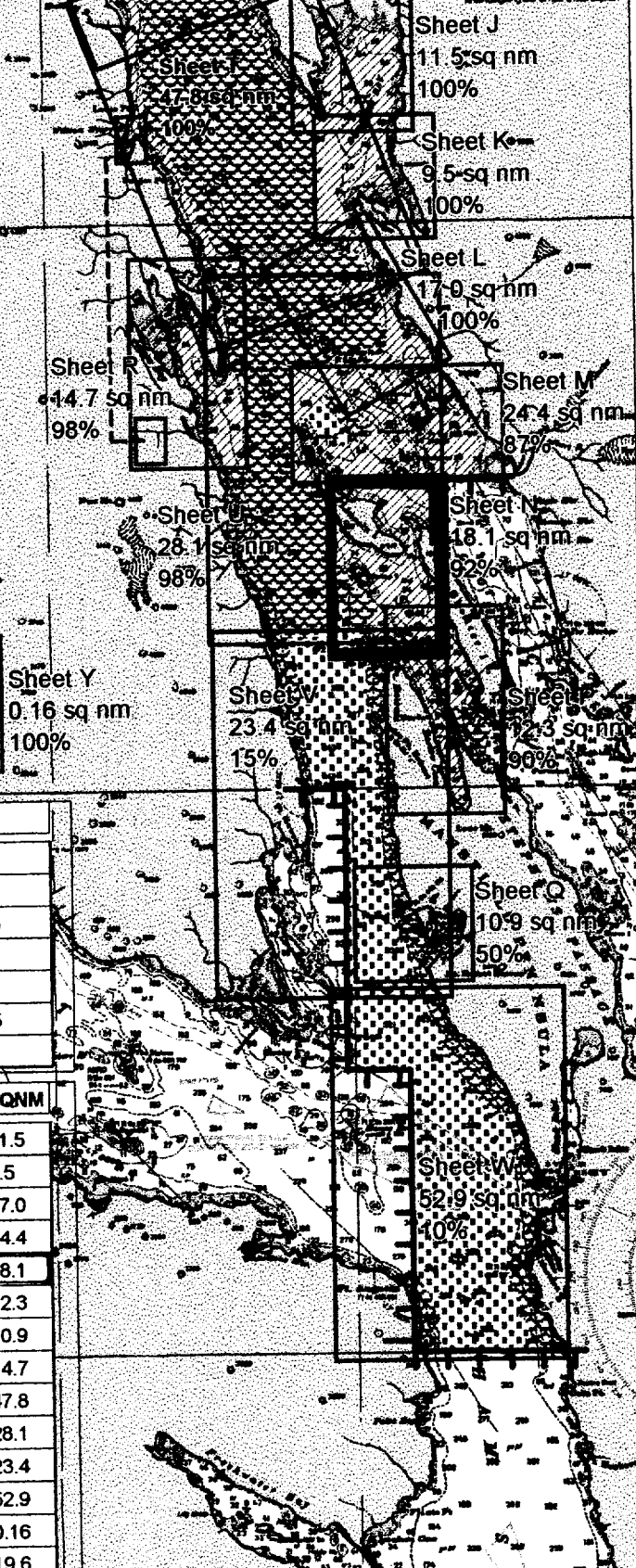
Chart 17300

	APRIL
	MAY
	JUNE

Downtime_Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	2	0	0
Electronic -Hr	2	2	0

CHES
 Controlled by Protective Proclamation, State of Alaska, and the U.S. Coast Guard. The application of this chart is subject to the rules of the U.S. Coast Guard. For 7 other rules, see the U.S. Coast Guard's website at www.uscg.gov. For 7 other rules, see the U.S. Coast Guard's website at www.uscg.gov. For 7 other rules, see the U.S. Coast Guard's website at www.uscg.gov.

Sheet X
 19.6 sq nm
 100%



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

Descriptive Report to Accompany Hydrographic Survey H10865

Field Number RA-10-5-99

Scale 1:10,000

April-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 H10865 corresponds to Sheet N (Sheet 5 in HPS) 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. REPORT, SEC. B

The survey area is located in Lynn Canal, Alaska, from Point Retreat to Lincoln Island. Survey limits are shown below in Figure 1. The survey's northern limit is latitude $58^{\circ}31'05''$ N into Lincoln Island shore and the southern limit is latitude $58^{\circ}24'34''$ N. The survey's western limit is longitude $135^{\circ}01'21''$ W and the eastern limit is longitude $134^{\circ}53'29''$ W, north of Shelter Island. Data acquisition was conducted from April 14, 1999 to June 7, 1999 (DN 104 to 158).

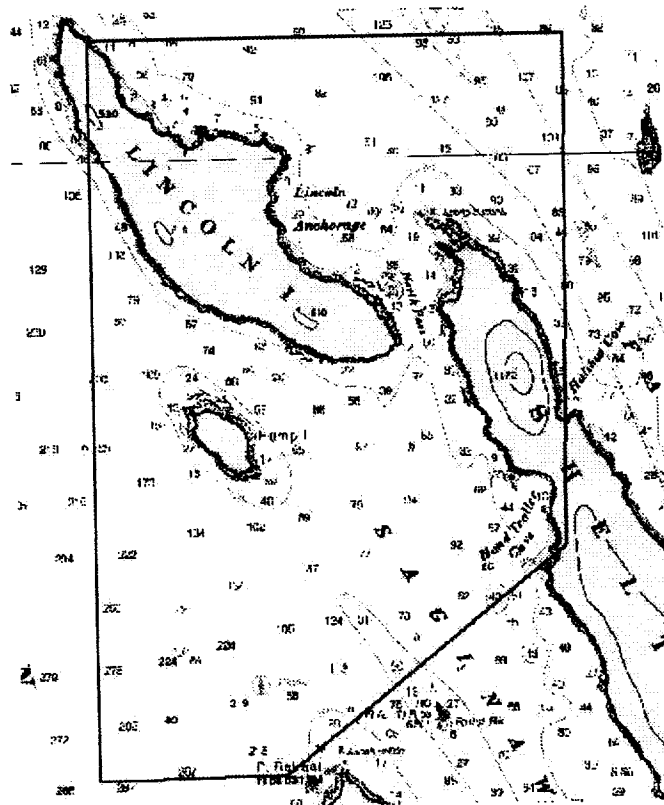


Figure 1 – Survey Limits

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 version 5.0. Final detached positions, features, and soundings based on observed tides were saved in MapInfo format. Raster image and shoreline data in MapInfo facilitated charted 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 software version 4.3.

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

Reson 8101 and SeaBeam 1050D MKII depth data were reviewed with CARIS-HIPS data cleaning programs. Depth flyers 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 knots.

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 sonar footprint. These processed data were excessed in a CARIS Workfile by selecting shoal soundings at a density of 5 meters x 5 meters. These excessed soundings were then suppressed at 2.5 mm at survey scale, and 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 not used, reducing the effective swath width to 120°.

After review and cleaning, SeaBeam 1050D MKII 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 sonar footprint. Prior to the final application of correctors in CARIS, the heave, pitch and roll data were manually deleted from the HDCS data to prevent these data from being applied twice. The heave, pitch and roll values have been archived in TAR format and left with the HDCS data in the event they are needed at a future date. These data were then extracted to a CARIS Workfile with a grid size of 5 meters x 5 meters. These soundings were further excessed by suppressing soundings with a shoal bias to produce one sounding every 2.5 mm at survey scale. Processed soundings were then exported into HPS through HP Tools.

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

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

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. 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 but can also be used to provide imagery of features such as wrecks, rocks, and obstructions.

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 platform 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 and Knudsen 320M, 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 the Separates. *

2. Launch Shallow Water Multibeam (SWMB) (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 path perpendicular to the vessel's path. The Reson 8101 ensonifies the seafloor with 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 the Separates. **

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. SWMB launches were not used for shoreline verification due to the extremely high risk of damaging the SWMB transducers on submerged rocks.

3. SeaBeam 1050D MKII ✓

The SeaBeam 1050D MKII 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 vessel motion during survey operations, 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 the Separates. **

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 H10865 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.

* FILED WITH THE HYDROGRAPHIC DATA

G. CORRECTIONS TO ECHO SOUNDINGS ✓

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 echosoundings. Information on the casts is included in the Survey Information Summary report and in (Separate IV, Sounding Equipment Calibrations and Corrections*)

The 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 VELOCITY, version 4.0, 1998. New for the 1999 field season is the program VELOCWIN version 4 beta 2, a GUI interface for the DOS program VELOCITY, with the additional ability to directly generate and export 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 correspond to the last digit of the 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.

SWMB launches (VN2121, 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° and a heave accuracy of 0.1 meter. Serial numbers are located in Appendix VI. *

RAINIER utilizes a TSS 335B attitude sensor, which provides attitude data (heave, pitch and roll) to correct for the effects of vessel motion 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° – 0.1°. 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 applied to the sounding data during processing. VCF files define the physical relationship 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 a "patch test" conducted at Port Angeles, WA on March 26-28, 1999. System biases for RAINIER were determined during a "patch test" conducted in Lynn Canal, southeast Alaska on May 21, 1999. A copy of each vessels VCF are included in the Project Related Data for OPR-O340-RA.

Predicted Tidal Correctors ✓

For the 1999 field season, the Oceanographic Products and Services Division (OPSD), User Services Branch (N/CS41), supplied no predicted tides for OPR-O340-RA-99. Predicted tide tables were generated for both HPS and CARIS using Tides & Currents v2.5. Tide correctors for H10865 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 inspection of the VBES soundings. CARIS tide table whbay_new.tid was also based on Tides & Currents and was used throughout the entire CARIS processing pipeline.

Once data acquisition was complete and all sounding data consolidated in HPS, OPSD preliminary observed tides for Juneau (945-2210) were downloaded from the Internet and used to create HPS table #1. The MapInfo tidal zoning table supplied by OPSD was then imported into HPS using the MapBasic application HPT_UTIL.MBX and HP Tools v.3.4.1. 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 H10865 are included in the Separates^{**} of this report. Tidal correctors as provided in the Project Instructions for H10865 are provided in the Survey Information Summary included with this report.

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 OCT. 6, 1999 IS ATTACHED.

H. HYDROGRAPHIC POSITION CONTROL ✓ SEE EVAL. REPORT, SEC. H

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

All soundings were positioned using differential GPS (DGPS). VHF reference stations were set up at stations JOE and CURTIS. Due to its proximity to the H10865 survey area, station CURTIS was used as the primary station for VHF differential correctors. In addition, differential corrections from the US Coast Guard Beacon at GUSTAVUS were also utilized during this survey. DGPS reference station information is 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 the Separates.*

I. SHORELINE ✓ SEE EVAL. REPORT, SEC. J

Method of Shoreline Verification ✓

No official registered shoreline was supplied by N/CS341 for any of the eastern shoreline for the entire Lynn Canal project. Prior surveys and digitized versions of chart 17316 also proved to be of poor quality for the area covered by H10865. This problem was resolved by registering NASA aerial photos acquired from the U.S. Forest Service. The photos were scanned and registered using prominent landmarks along the shoreline. To differentiate between areas of gently sloping beaches and ledges, the registered photos were digitized in MapInfo using a combination of the shoreline on the photograph, chart, and notes taken during vertical beam echo sounder mainscheme. The resultant shoreline was then exported in .DXF format for use with Hypack during data acquisition. While conducting shoreline verification, numerous detached positions were obtained on ledges and rocks to field check the NASA photo's registration. Adjustments to the registration of the digitized shoreline were then made based upon the detached positions. This method proved to be remarkably reliable and accurately depicted the shoreline when checked against the detached positions, soundings, and tracklines. During shoreline verification these digitized NASA photos were treated as official digital manuscript (DM) shoreline for the purpose of distinguishing new shoreline features.

The following table lists reference points used to register NASA satellite photograph number 25 into MapInfo.

LOCATION	POINT NUMBER	POSITION
Central Shelter Island	1	58°27'38.48" N 134°53'31.41" W
North end of Gull Island (Outside of H10865 survey area)	2	58°30'15.02" N 134°52'7.46" W
North end of Lincoln Island	3	58°31'13.12" N 135°01'42.97" W
South end of Hump Island	4	58°27'13.88" N 134°58'56.18" W

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 while slowly transiting along the shore, and are intended to aid chart compilation.

Detached positions taken during shoreline verification were recorded within HYPACK and on DP forms. These indicate significant features and features not found on the DM or 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 were then transferred to the final sounding plot.

Changes and New Features ✓

Several changes and new features were found and are depicted on the "DP and BS Plot, and final sounding plot." DM rocks and islets were often identified as high points of new ledges or reefs.

Recommendations ✓

The Hydrographer recommends that the shoreline as depicted on the "DP and BS Plot" (Mapinfo digital files "n_shoreline" and "n_shorelineupdates") and final sounding plot be used to supersede shoreline information compiled on the digitized NASA photos.

Charted Features ✓

Charted rocks were either identified as new rocks, DM rocks, high points or extensions of DM ledges and reefs with the following exception:

A charted rock (AWOIS #52406) on the southwestern shore of Shelter Island was searched for and not found. An uncharted reef was found approximately 490 m northwest of the charted rock. See Section M, Item Investigation Reports for a discussion of this item.

Recommendations ✓

The charted shoreline should be revised using the manuscript shoreline and fieldwork notes as recorded in the Mapinfo digital files named "n_shoreline" and "n_shorelineupdates".

J. CROSSLINES ✓

VBES crosslines totaled 16.78 nautical miles, or 5.6% of mainscheme VBES hydrography. VBES crosslines agreed to within 1 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. The Quality Control Report (CARIS HIPS) for the checkline file averaged a 0.1247 meter deviation from the reference surface, with an average standard deviation of 1.647 meters. See Appendix VI for the detailed report. *

K. JUNCTIONS ✓ SEE EVAL. REPORT, SEC. L

The following contemporary surveys junction with H10865, and are shown in Figure 2 below.

Registry #	Scale	Date	Junction Area
✓ H10680	1:10,000	1996	East
✓ H10866	1:10,000	1999	North
✓ H10870	1:10,000	1999	Southeast
✓ H10880	1:20,000	1999	West
✓ H10881	1:20,000	1999	Southwest

Soundings from these junction surveys were found to be in good agreement, matching generally within 1-2 meters in areas of low vertical gradients. Greater depth differences were noted in areas of steep relief. Present survey depth contours matched well with junction survey depth curves. Final comparisons will be made at the PHB after application of smooth tides.

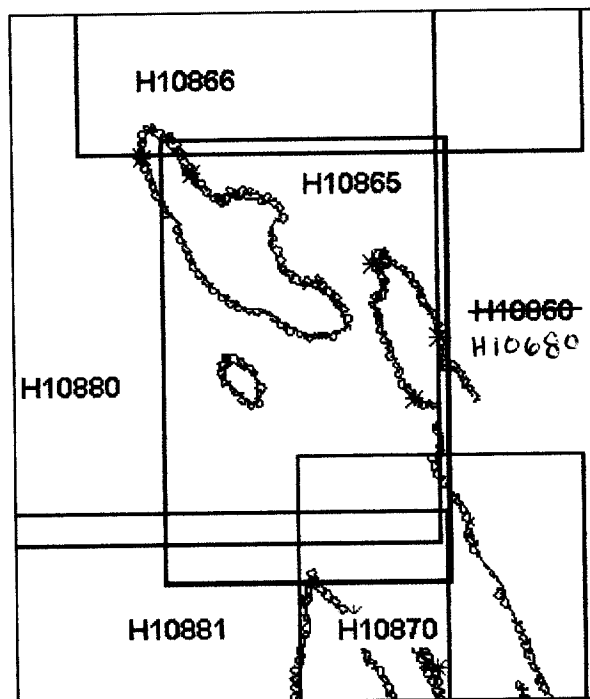


Figure 2 - Junction Surveys

L. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL. REPORT, SEC. M

Five prior surveys were compared to survey H10865 and are shown in Figure 3 below.

Registry #	Scale	Date
✓ H-3986WD	1:20,000	1917
✓ H-3985WD	1:20,000	1917
✓ H-2056	1:40,000	1890
✓ H-1602A	1:40,000	1884
✓ H-4228 W/D	1:40,000	1922

Prior survey soundings were found to be in general agreement with those from H10865 except as noted below. A comparison of survey H10865 with surveys H-4228 and H-3985 WD was not conducted. The scans were of very poor quality; no least depths were discernible and annotations on the priors were illegible.

When comparing present survey depths to H-2056, discrepancies were noted along the eastern shore of Lincoln Island north of Lincoln Anchorage, off the southern end of Lincoln Island and around Hump Island. A depth of 56 fm is depicted on survey H-2056 at 58°27'45"N, 134°57'01"W, while H10865 shows depths in the vicinity of 84 fm, using the RAINIER multibeam system. A depth of 39 fm is depicted on survey H-2056 at 58°27'50"N, 134°56'25"W, while H10865 shows depths of 78 fm, using VBES. The present survey shows no other signs of shoaling around either of these soundings.

Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be conducted at PHB after application of smooth tides.

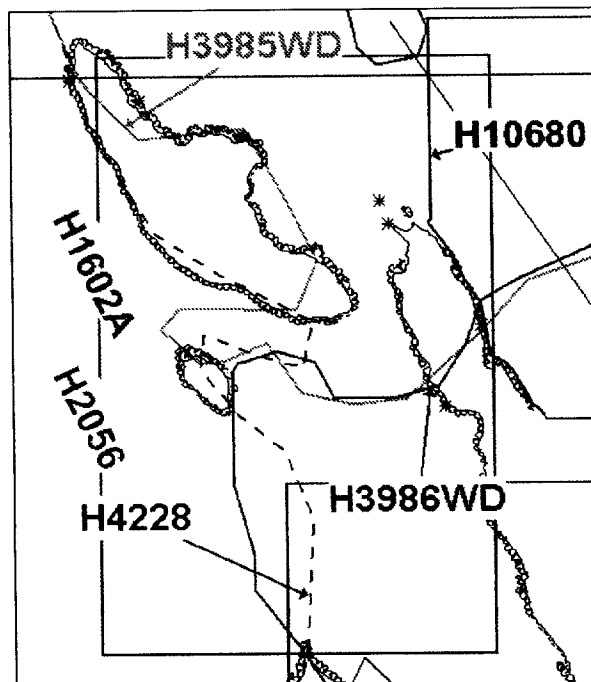


Figure 3 – Prior Surveys

M. ITEM INVESTIGATION REPORTS ✓ SEE EVAL. REPORT, SEC. N

Two AWOIS items were assigned on survey H10865 and are addressed below.

AWOIS 52406

1. Area of Investigation: ✓

AWOIS #: 52406

Reported Position: Latitude: 58/27/10.8N

Type of Feature: Rock Awash

State and Locality: Lynn Canal, Alaska

Longitude: 134/54/30.47W Datum: NAD83

Reported Depth: Awash at half tide

2. Description of Source Item: ✓

History

CL814/50 –Alaska Bureau of Mines; Rock awash at half tide connected to the shore of Shelter Island by a reef at low tide, 150 or 200 yards offshore at approximate LAT 58/27/12N, LON 134/54/24W (NAD27). Existence of rock is known locally but it would be dangerous to a stranger. (Charted as PD). Entered 8/98 RWD)

3. Survey Requirements: ✓

Visual search; Echosounder search; Dive investigation. 150 meter search radius. ✓

4. Method of Investigation: ✓

Shallow water multibeam and singlebeam was run in the vicinity of the charted rock, in addition to visual inspection shoreline (DN 107, 132; VN2121, 2123).

5. Results of Investigation: ✓

An uncharted reef was found 490 meters northwest of the rock. Detached positions 21698 – 21701 define the position on the new reef. See Figure 4 below.

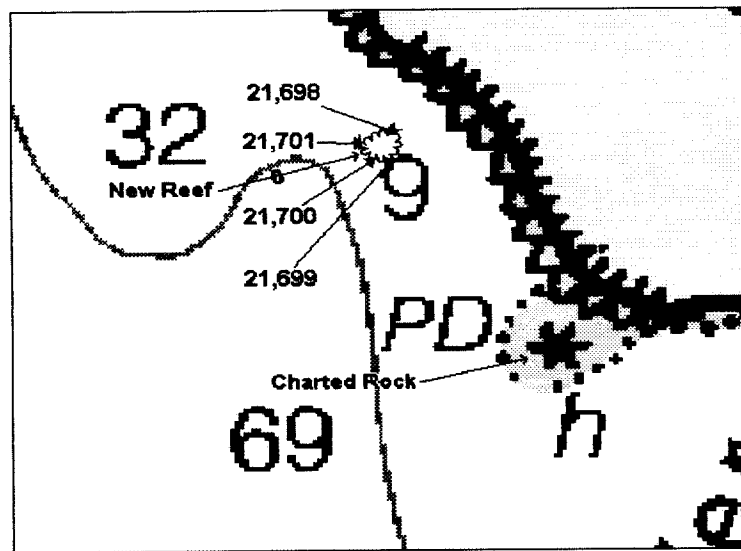


Figure 4 – AWOIS 52406

6. Comparison with Prior Surveys: ✓

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

7. Comparison with the Chart and Charting Recommendation: ✓

AWOIS 52406 was compared to Chart 17316 (18th Ed.; Jul 18, 98; 1:80,000). The new reef was submitted as a Danger to Navigation on June 13, 1999. ✓ A copy of the danger letter is included in Appendix A. ✱

The Hydrographer recommends that the charted rock PD at 58° 27' 10.8"N, 134° 54' 30.47"W be deleted from the chart and a new reef be charted defined by positions 21698-21701. *CONCERN*

AWOIS 52407

1. Area of Investigation: ✓

AWOIS #: 52407

State and Locality: Lynn Canal, Alaska

Reported Position: Latitude: 58/25/42.0N

Longitude: 135/00/00.00W

Datum: NAD83

Type of Feature: ~~Non-Dangerous Wreck~~

Reported Depth: N/A

CHARTED USING "DANGEROUS WRECK" SYMBOL

2. Description of Source Item: ✓

History

LNM49/35 (12/5/95)—17CGD; Tongass, Non-dangerous wreck*, position given in LAT 58/24/42N, LONG 135/00/00W (PA). (Entered 8/98 RWD) **CHARTED USING "DANGEROUS WRECK" SYMBOL.*

3. Survey Requirements: ✓

Multibeam investigation; Singlebeam investigation; 200% side scan. 1000 meter search radius.

4. Method of Investigation: ✓

Search radius was covered by the ship's multibeam system (DN 155, VN 2120).

5. Results of Investigation: ✓

No evidence of the wreck was found within a 1000 meter search radius. Given the depth of the water in this search area, the beam footprint and beam width makes it difficult to detect a wreck.

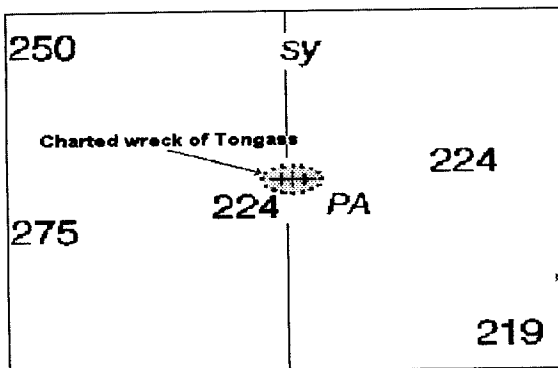
6. Comparison with Prior Surveys: ✓

This wreck is not depicted on any prior survey.

7. Comparison with the Chart and Charting Recommendation: ✓

AWOIS 52407 was compared to Chart 17316 (18th Ed.; Jul 18, 98; 1:80,000). This item was not submitted as a Danger to Navigation. Figure 5 below depicts the wreck on chart 17316. ✓

Due to the depth of water and the size of the multibeam footprint, the Hydrographer recommends that the dangerous wreck symbol be deleted, and that a Wreck PA be charted in the reported position. *DO NOT CONCUR.*



*CHARTED SYMBOL
DELETED. SEE
EVAL. REPORT,
SECTION N.*

Figure 5 – AWOIS 52407

N. COMPARISON WITH THE CHART ✓ SEE EVAL. REPORT, SEC. O

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

Chart	Scale	Edition Number	Date	Datum
✓ 17316	1:80,000	18 th	July 18, 1998	NAD 83
✓ 17300	1:209,978	27 th	August 14, 1993	NAD 83

Present survey soundings were in good agreement with Chart 17316, generally within one fathom. ✓
Exceptions are noted below.

A 4 ½ fathom sounding is depicted on chart 17316 (position 58°30'33"N, 135°00'00"W), in the northwest corner of the sheet. Multibeam coverage in the area revealed a shoal depth of 21 fathoms. ✓

A 12 fathom sounding is depicted on chart 17316 (position 58°29'01"N, 135°56'59"W) ^{near} ~~near the northern shore of Lincoln Island extending into~~ Lincoln Anchorage. An uncharted ledge was found during shoreline verification extending to the 12 fathom sounding. The ledge is also shown on the digitized NASA photo. This feature was submitted as a Danger to Navigation.

A charted underwater cable crossing lies within the H10865 survey area. The cable crossing was not investigated and is shown in brown on the final DP and BS plot. ✓ The Hydrographer recommends retaining the cable crossing as charted. *CONCUR*

A charted pilot boat area, north of Point Retreat, lies within the H10865 survey area. Pilot boats were not observed in the area, and a further investigation was not conducted. The Hydrographer recommends that the pilot boat symbol and the designation "Pilots" remain as charted. *CONCUR*

Non-sounding features are discussed in Section I. The Hydrographer recommends that shoreline detail and soundings from survey H10865 be used to supersede the chart in their common areas. *CONCUR*

Final sounding comparisons will be made at PHB after application of smooth tides.

Dangers to Navigation ✓

Three dangers to navigation were discovered during survey H10865 and reported to the Seventeenth Coast Guard District on June 13, 1999. Copies of the Dangers to Navigation Reports are included in Appendix I. **

A new reef was found and defined by the positions: 58°27'24.84"N, 134°54'45.77"W (northern extent, Pos. # 21698); 58°27'24.02"N, 134°54'49.68"W (western extent, Pos. # 21701); 58°27'22.87"N, 134°54'48.26"W (southern extent, Pos. # 21700); and 58°27'22.86"N, 134°54'46.13"W (eastern extent, Pos. # 21699). ✓

A charted ledge was found to have a northern extent to position 58°29'02.27"N, 134°57'03.55"W (Pos. # 52024). A 12 fathom sounding is charted in this location. This item was reported as Pos. # 51386 in the danger to navigation letter. ✓ The difference in fix numbers is due to re-numbering after submission to the Coast Guard. ✓

Two new reefs were found with a foul area between them. The northern most reef was defined by position 58°29'33.51"N, 134°55'35.12"W (northern extent, Pos. # 21852) and 58°29'29.31"N, 134°55'30.44"W (southern extent, Pos. # 21863). The southern most reef was defined by positions, 58°29'31.17"N,

* FILED WITH THE HYDROGRAPHIC RECORDS
** ATTACHED

134°55'48.24"W (northern extent, Pos. # 21865) and 58°29'27.42"N, 134°55'41.69"W (southern extent, Pos. # 21864). ✓

After further analysis of the survey data, six additional dangers were discovered. A danger to navigation report was sent to the Coast Guard on August 18, 1999. Copies of the Dangers to Navigation Reports are included in Appendix I. *

(1.1 reduced) **
A shoal area with a depth of 1.2 fathoms (submitted as a 1 fathom shoal) was found at 58°29'34.71"N, 134°56'16.54"W (Pos. #76722). The nearest charted sounding is a 5½ fathom shoal. ✓

(9.7 reduced) **
A shoal area with a depth of 9.7 fathoms (submitted as a 9 ½ fathom shoal) was found at 58°29'33.31"N, 134°57'32.55" (Pos. #71570). The nearest charted sounding is 29 fathoms. ✓

(0.7 reduced) **
A shoal area with a depth of 0.8 fathoms (submitted as a ¾ fathom shoal) was found at 58°30'22.92"N, 134°59'46.12" (Pos. #70670). The nearest charted sounding is 4 fathoms. ✓

(2.3 reduced) **
A shoal area with a depth of 2.4 fathoms (submitted as a 2 ¼ fathom shoal) was found at 58°28'04.98"N, 134°55'29.42" (Pos. #78242). This is currently charted as a 3½ fathom shoal. ✓

(5.7 reduced) **
A shoal area with a depth of 5.8 fathoms (submitted as a 5 ¾ fathom shoal) was found at 58°27'58.77"N, 134°59'25.12" (Pos. #79971). The nearest charted soundings are 24 and 68 fathoms. ✓

(4.5 reduced) **
A shoal area with a depth of 4.5 fathoms (submitted as a 4 ½ fathom shoal) was found at 58°30'29.94"N, 134°59'45.19" (Pos. #70550). This shoal falls just offshore of a charted 4 fathom depth. ✓

O. ADEQUACY OF SURVEY ✓

Survey H10865 is complete and adequate to supersede prior soundings and features in their common areas. CONCUR:

P. AIDS TO NAVIGATION ✓

Point Retreat light and Faust Rock buoy are located on adjacent survey H10870. Information on these aids to navigation are included with the report for that survey.

Q. STATISTICS ✓

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

R. MISCELLANEOUS ✓

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

The charted anchorage area on the southeast side of Lincoln Island offers protection against severe south and west winds, but is unprotected from the north. Hand Troller Cove, to the south of Lincoln Island on the west side of Shelter Island provides protection against north and east winds.

Small sport fishing and sight seeing vessels are the primary traffic in the area. Larger fishing vessels and tugs towing astern were seen in the southwest portion of the sheet transiting between Saginaw Channel and Lynn Canal. North Pass is often used by small vessels and appears to be a popular spot for marine wildlife viewing by the tour boats.

S. RECOMMENDATIONS ✓

Because no photogrammetric shoreline was provided for the entire survey area, the Hydrographer recommends that shoreline depicted on Survey H10865 be used to update the chart in their common areas. 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.

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/CS34

Respectfully Submitted,

Bradley H. Fritzler ENS/NOAA

Bradley Fritzler
Ensign, NOAA

Approved and Forwarded,

Daniel R Herlihy, CDR/NOAA
for

Alan D. Anderson
Captain, NOAA
Commanding Officer

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

} NOT ON
H-10865

→ SOUTH TIP, HUMP ISLAND

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	2	2						
2122	2	1			1	1		
2123	3	2						
2124	2				1	1		
2125	2	1			1	1	2	
2126	2			1				

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
3		104	340	58/34/18	104-112
				134/57/54	
7		116	302	58/36/02	116-117
				135/00/08	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
SEA3	00 hr 00 min	X0.98
SEA59	00 hr 00 min	X0.97

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-2318	BARLOW COVE	4/5/99	6/7/99
945-2346	COVE POINT	4/4/99	6/2/99

Statistics Summary

Type	Total:
BS	13
DP	66
MBMS	40.35
MBXL	7.13
MS	296.33
S/L	17.1
SPLIT	60.36
SWMB	71.04
XL	16.78

Percent XL:

SQNM:



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
 August 18, 1999

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

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 H10865 in Lynn Canal, southeast Alaska. The dangers are shown graphically on the attached chartlet.

The following dangers to navigation affect chart 17300, 28th edition, 1998, 1:209,978 and chart 17316, 18th edition, 1998, 1:80,000. The position is on the NAD 83 datum and depth has been corrected to Mean Lower Low Water using predicted tides.

Feature	Depth(fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)
✓ Shoal	1	58:29:34.71	134:56:16.54	76722	2.3
✓ Shoal	9 ½	58:29:33.31	134:57:32.55	71570	17.8
✓ Shoal	¾	58:30:22.92	134:59:46.12	70670	1.6
✓ Shoal	2 ¼	58:28:04.98	134:55:29.42	78242	4.3
✓ Shoal	5 ¾	58:27:58.77	134:59:25.12	79971	10.6
✓ Shoal	4 ½	58:30:29.94	134:59:45.19	70550	8.3

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-08-99. 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

**ADVANCE
 INFORMATION**





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.

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
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 52024*	-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.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
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

* RENUMBERED FROM POS # 51386 TO # 52024



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.

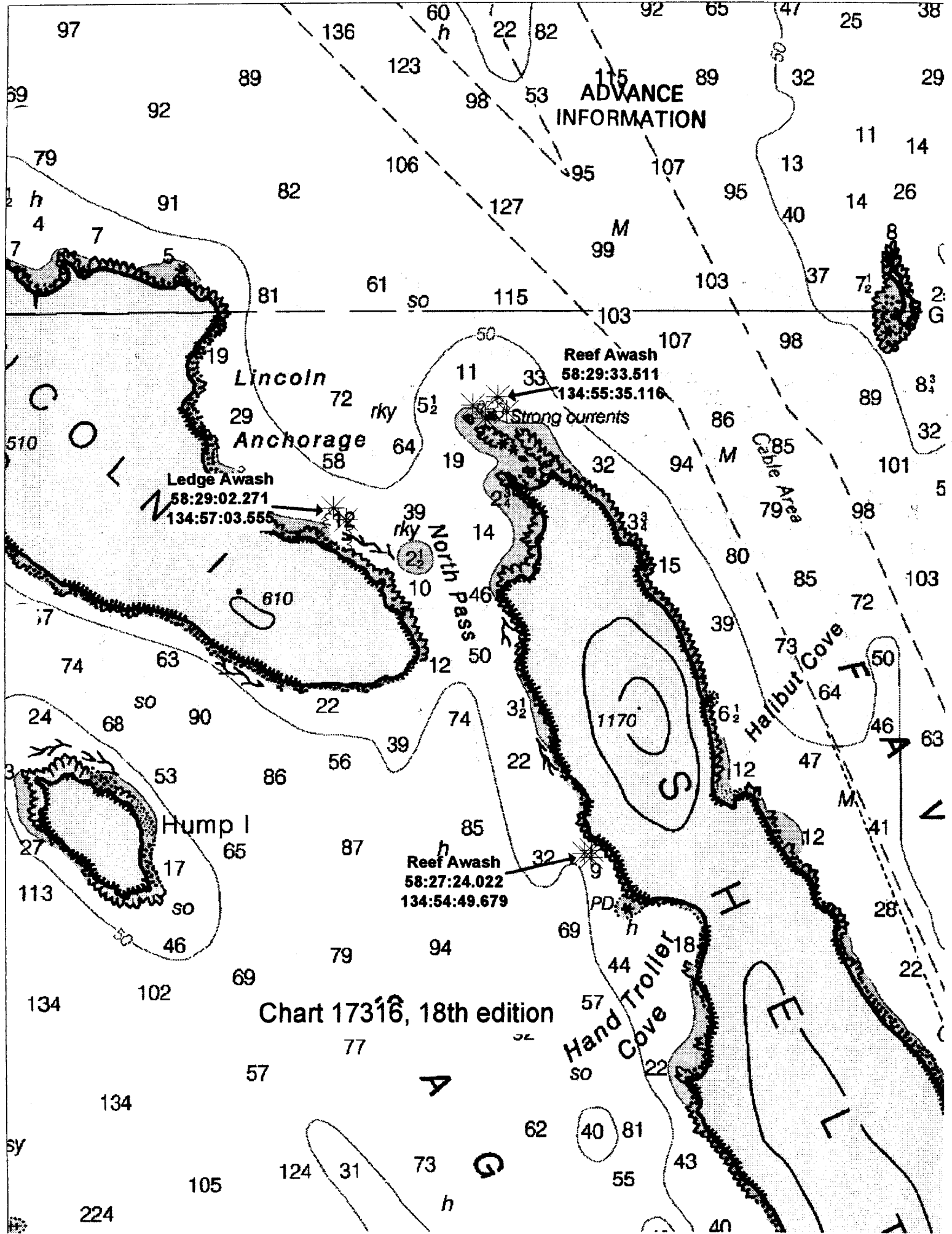
Sincerely,



Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachments

cc: NIMA
PMC
N/CS261
N/CS34



ADVANCE INFORMATION

Lincoln
Anchorage

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

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

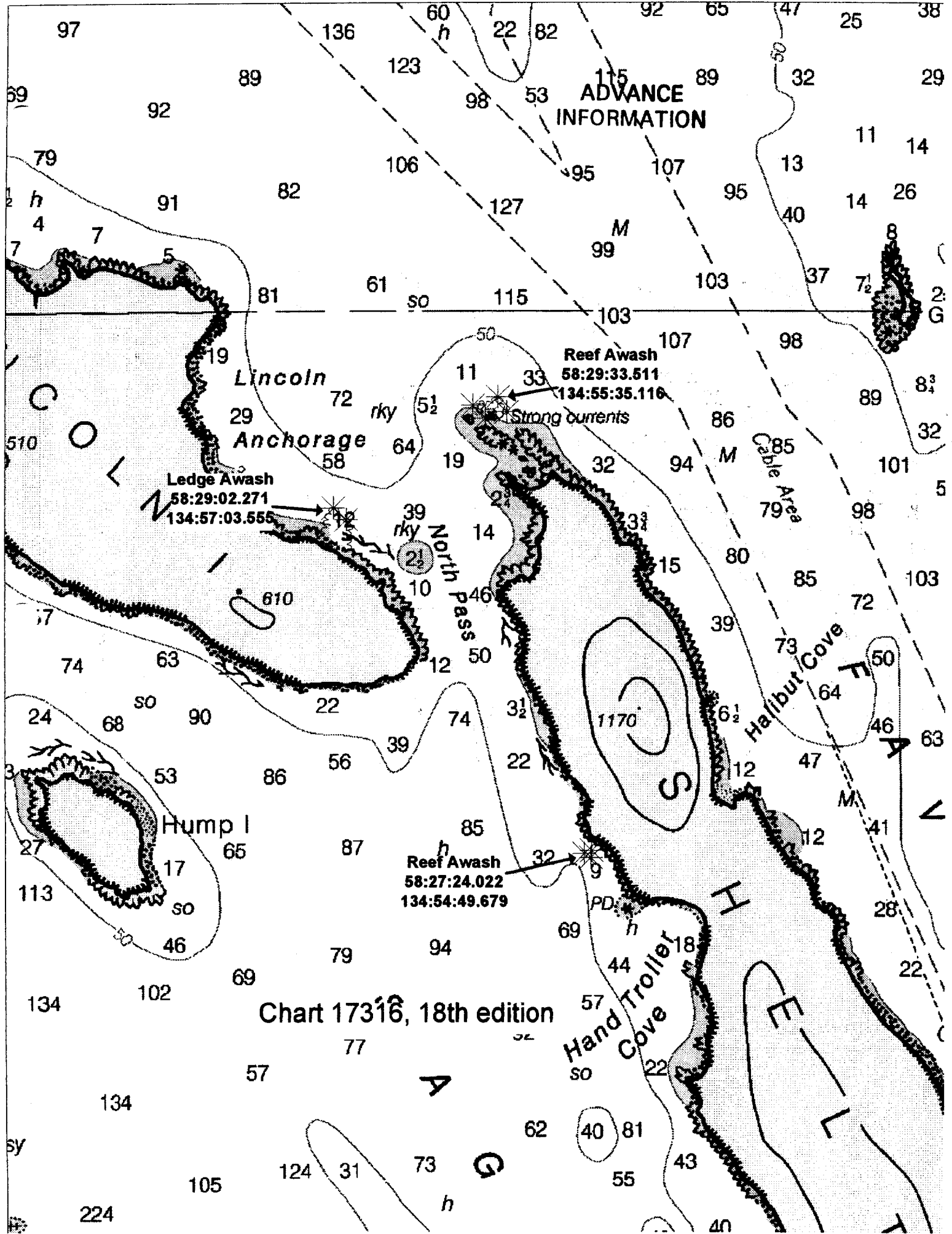
Reef Awash
58:27:24.022
134:54:49.679

Chart 17316, 18th edition

Hand Troller
Cove

Halibut Cove

Cable Area



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 #
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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
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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 52024	-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.

Feature	Depth (fm)	Latitude (N)	Longitude (W)	Position #	Depth (m)	Survey #
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.

/signed/
Alan D. Anderson
Captain, NOAA
Commanding Officer

* RENUMBERED FROM POS. #51386 TO #52024



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
OFFICE OF COAST SURVEY
Pacific Hydrographic Branch
Seattle, Washington 98115-0070

September 30, 1999

Commander (OAN)
Seventeenth Coast Guard District
P.O. Box 25517
Juneau, AK 99802

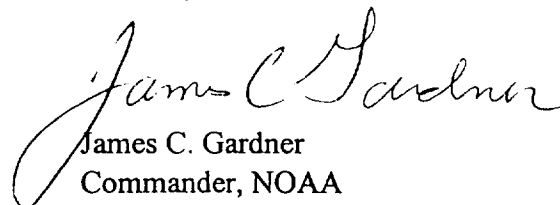
Dear Sir:

During office review of hydrographic survey H-10865, Alaska, Lynn Canal, Point Retreat to Lincoln Island, one additional feature was found and is considered to be a potential danger to navigation.

It is recommended that the enclosed Report of Dangers to Navigation be included in the Local Notice to Mariners.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6836.

Sincerely,


James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Enclosure

cc: NIMA
NCS/261
NOAA Navigation Advisor Alaska



REPORT OF DANGERS TO NAVIGATION

Hydrographic Survey Registry Number: H-10869

Survey Title: State: ALASKA
 Locality: LYNN CANAL
 Sublocality: POINT RETREAT TO LINCOLN ISLAND

Project Number: OPR-O340-RA

Survey Date: MAY - JUNE 1999

Feature is reduced to Mean Lower Low Water using preliminary tides and is positioned on NAD 83.

Chart affected: 17316 18TH Edition July 18, 1998, scale 1:80,000 NAD 83

<u>DANGER TO NAVIGATION</u>	<u>LATITUDE(N)</u>	<u>LONGITUDE(W)</u>
*Ledge exposed 3 ft	58/27/22.87	134/54/48.26

* Portrayed on graphic as a rock

Questions concerning this report should be directed to the Chief, Pacific Hydrographic Branch at (206)526-6836.

{ SAME AS AWOIS 52406
{ SAME AS "REEF AWASH" DANGER, POSITION # 21701
{ SAME AS "NEW REEF", POSITION #'S 21698, 21699, 21700, 21701

APPROVAL SHEET

for

H10865

RA-10-05-99

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



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-10865

LOCALITY: Pt. Retreat to Lincoln Island, Lynn Canal, AK
TIME PERIOD: April 14 - June 7, 1999

TIDE STATION USED: 945-2346 Cove Point, Berners Bay, AK
Lat. 58° 45.1'N Lon. 135° 01.6'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.637 meters

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 & SEA65.

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: Use tide data from the appropriate station with applicable zoning correctors for each zone according to the order in which they are listed in the Tidezone corrector files. For example, tide station one(TS1) would be the first choice for an applicable zone followed by TS2, etc. when data are not available.

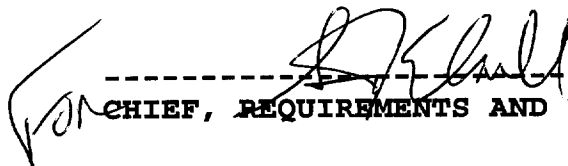
Note 3: Juneau, AK and Skagway, AK were used as datum control for subordinate tide stations and for tidal zoning in this hydrographic survey. Accepted datums for these two stations have been updated recently and have changed significantly from previous values.



TIDE NOTE FOR HYDROGRAPHIC SURVEY SHEET H-10865 cont.

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.

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>.



CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-O340-RA-99,
Sheet H-10865.

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

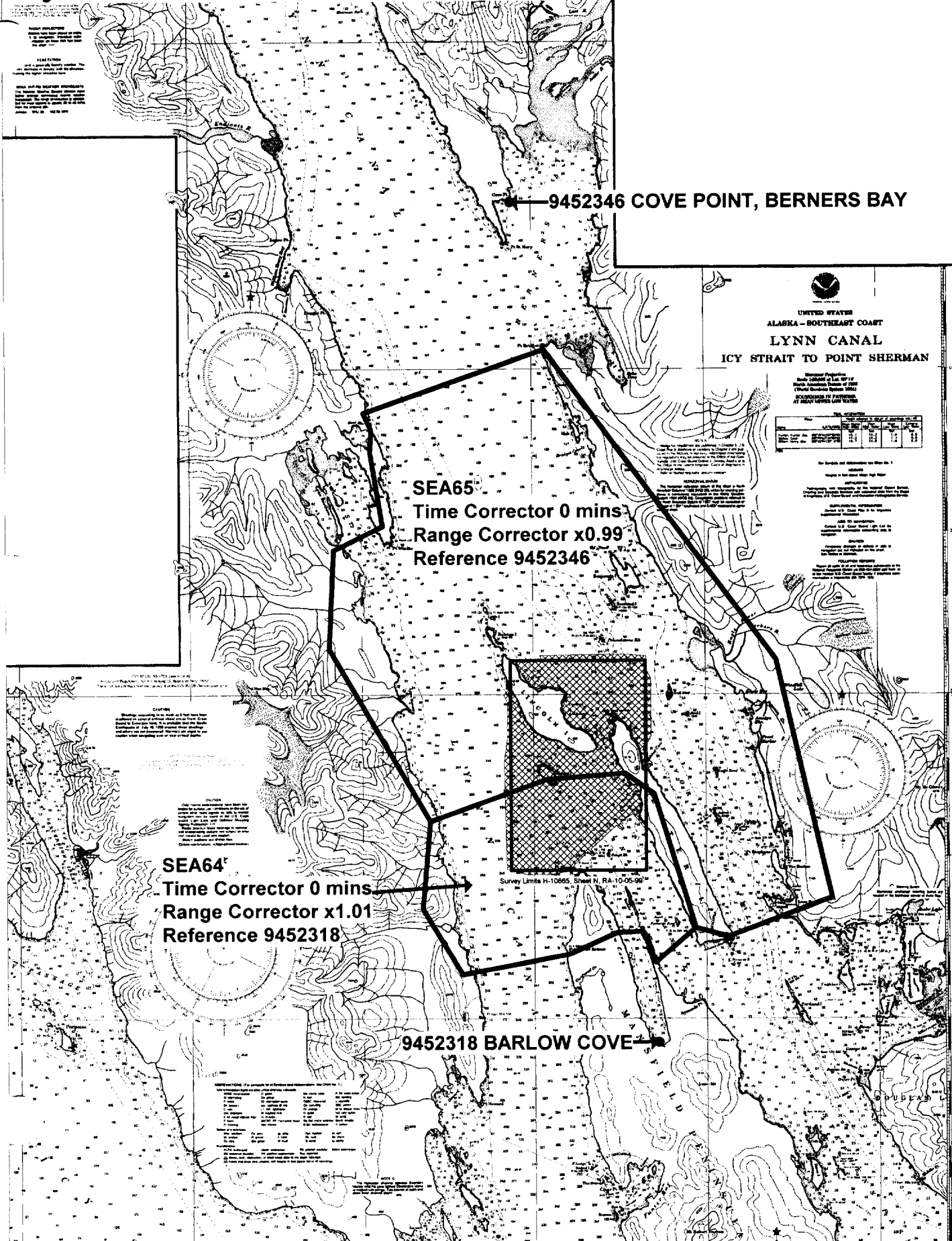
	Tide Station Order	AVG Time Correction	Range Correction
SEA64			
-134.966311 58.366237	9452318	0	1.01
-135.070146 58.355822			
-135.108804 58.389757			
-135.101046 58.434896			
-134.987639 58.456439			
-134.911523 58.459634			
-134.883282 58.448923			
-134.843845 58.379935			
-134.882525 58.362237			
-134.894794 58.378041			
-134.920234 58.377383			
-134.966311 58.366237			
Zone SEA65			
-134.712062 58.395475	9452346	0	0.99
-134.81273 58.375272	9452318	0	1.02
-134.843845 58.379935			
-134.883282 58.448923			
-134.911523 58.459634			
-134.987639 58.456439			
-135.101046 58.434896			
-135.198572 58.523417			
-135.19381 58.574286			
-135.146121 58.586495			
-135.157859 58.623886			
-135.156902 58.635886			
-135.164237 58.644226			
-134.988058 58.676589			
-134.765259 58.517721			
-134.712062 58.395475			

Final Tidal Zoning for OPR-O340-RA-99

Lynn Canal, AK - Sheet H-10865

SOUNDINGS IN FATHOMS

17316



SEA65
Time Corrector 0 mins
Range Corrector x0.99
Reference 9452346

SEA64
Time Corrector 0 mins
Range Corrector x1.01
Reference 9452318

9452346 COVE POINT, BERNERS BAY

9452318 BARLOW COVE

UNITED STATES
ALASKA - SOUTHEAST COAST
LYNN CANAL
ICY STRAIT TO POINT SHERMAN

Tide	
Time	Height
High Water	10.0
Low Water	2.0

Survey Limits H-10865, Sheet N. RA-10-05-99

V. TIDES AND WATER LEVELS

- a) Field Tide Note
- b) Request for Approved Tides

GEOGRAPHIC NAMES

H-10865

Name on Survey	A ON CHART NO. 17316		B ON PREVIOUS SURVEY No.		C ON U.S. QUADRANGLE MAPS		D FROM LOCAL INFORMATION		E ON LOCAL MAPS		F P.O. GUIDE OR MAP		G RAND McNALLY ATLAS		H U.S. LIGHT LIST		K	
ALASKA (title)	X		X															1
FAUST ROCK	X		X															2
HALIBUT COVE	X		X															3
HUMP ISLAND	X		X															4
LINCOLN ANCHORAGE	X		X															5
LINCOLN ISLAND	X		X															6
LYNN CANAL	X		X															7
NORTH PASS	X		X															8
RETREAT, POINT	X		X															9
SAGINAW CHANNEL	X		X															10
SHELTER COVE	X		X															11
SHELTER ISLAND	X		X															12
MANSFIELD PENINSULA	X																	13
Added subsequent to Chief Geographer approval																		14
																		15
																		16
																		17
																		18
																		19
																		20
																		21
																		22
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																		24
																		25

Approved

Dominic J. Ramesburg
Chief Geographer

DEC 15 1999

HYDROGRAPHIC SURVEY STATISTICS

H-10865

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				1		

SHORELINE DATA	
SHORELINE MAPS (List):	CG 10424, CG 10425
PHOTOBATHYMETRIC MAPS (List):	N/A
NOTES TO THE HYDROGRAPHER (List):	N/A
SPECIAL REPORTS (List):	N/A
NAUTICAL CHARTS (List):	Chart 17316, 18th Ed., 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				
CONTROL STATIONS REVISED				
	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	305		305	
COMPARISON WITH PRIOR SURVEYS AND CHARTS				
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		50	50	
GEOGRAPHIC NAMES				
OTHER: (Chart Compilation)		134	134	
USE OTHER SIDE OF FORM FOR REMARKS				
	TOTALS	305	184	489

Pre-processing Examination by R. Davies	Beginning Date 8/25/99	Ending Date 10/1/99
Verification of Field Data by R. Mayor, E. Domingo, C. Barry	Time (Hours) 305	Ending Date 4/19/00
Compilation Check by D. Hill	Time (Hours) 2	Ending Date 5-12-00
Evaluation and Analysis by C. Barry	Time (Hours) 50	Ending Date 5/12/00
Inspection by D. Hill	Time (Hours) 4	Ending Date 5-24-00

EVALUATION REPORT H10865

A. PROJECT

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

B. AREA SURVEYED

The survey area is adequately described 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 area. Charted features and soundings inshore of this limit line have not been specifically addressed during survey operations and should be retained as charted. A page-size plot of the charted area depicting the specific limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of green mud and pebbles, with additional components including sand and gravel. Depths generally range from less than one fathom along the shoreline and in areas of shoal developments, to 314 fathoms in the southwest part of the survey area.

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 addressed in the hydrographer's report, section D.

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. MicroStation 95 was used during office processing to compile the smooth sheet.

Processed 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 equipment was not used during survey H10865.

F. SOUNDING EQUIPMENT

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

G. CORRECTIONS TO SOUNDINGS

Soundings and elevations below Mean High Water (MHW) have been reduced to Mean Lower Low Water (MLLW). The reducers include corrections for an actual tide, dynamic draft, and sound velocity. Additional reducers for multibeam survey data include heave, pitch and roll. These reducers have been reviewed and are consistent with NOS specifications.

Predicted tides were used for reduction of soundings during field processing. During office processing, soundings and elevations have been reduced to Mean Lower Low Water (MLLW) or Mean High Water (MHW), as appropriate with verified tide correctors obtained from the Center for Operational Oceanographic Products and Services (CO-OPS). The correctors are zoned from tide gages Cove Point, Berners Bay, Alaska, 945-2346 and Barlow Cove, Alaska, 945-2318.

H. CONTROL STATIONS

Control stations are adequately discussed in the hydrographer's report.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD 27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections:

Latitude: -1.194 seconds (-36.933 meters)
Longitude: 6.480 seconds (105.075 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 4.0 for 1:10,000 was computed for survey operations. The quality of some positions exceeded limits in terms of HDOP. These positions are isolated and occur randomly throughout the survey area. A review of the data, however, suggests that none of these fixes are used to position dangers to navigation. The features or soundings located by these fixes are consistent with the surrounding information. These fixes are considered acceptable. NAD 83 is used as the horizontal datum for plotting and position computations.

DGPS performance checks were conducted in the field and found adequate. 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 corrections to position data.

J. SHORELINE

The hydrographer used an unconventional and unauthorized source, registered NASA aerial photographs acquired from the U.S. Forest Service, for shoreline. The authorized source documents, shoreline map GC10424 and GC10425, were compiled on NAD 83 and applied to this survey during office processing. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Coastal Mapping Program. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet.

There were two MHW revisions on this survey. The new features are islets shown on the smooth sheet on the northwest coast of Hump Island, at latitude 58°27'45"N, longitude 134°59'44"W and latitude 58°27'37"N, longitude 134°59'42"W.

The shoreline maps and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

K. CROSSLINES

Crosslines are adequately discussed in the hydrographer's report.

L. JUNCTIONS

Survey H10865 junctions with the following surveys.

Survey	Year	Scale	Area
H10680	1996	1:10,000	East
H10866	1999	1:10,000	North
H10870	1999	1:10,000	Southeast
H10880	1999	1:20,000	West
H10881	1999	1:20,000	Southwest

The junctions with H10680 and H10866 were not formally completed since these surveys were processed previously. The junction with H10680 is excessive in extent. While soundings for the junction with survey H10866 are in close agreement, generally within one fathom, soundings for the junction with survey H10680 tend to agree within two fathoms, and in some areas the older survey tends deeper by up to three fathoms. The cause of these discrepancies is unknown. A few soundings from H10680 have been transferred in color within the common area to better delineate the bottom configuration and to support depth curves common to both surveys. "Adjoins" notes have been added to the smooth sheet.

The junction with H10881 is also excessive in extent. Soundings for the junctions with surveys H10870 and H10881 are both in close agreement, generally within one fathom. Sounding differences up to three fathoms also occur with the junction with H10881, with the H10865 soundings tending shoaler. For the deep-water junction with H10880 there are one to four fathom differences throughout the common area, with H10865 soundings tending shoaler. The cause of these discrepancies is unknown. A few soundings from each of these junctional surveys have been transferred in color within the common areas to better delineate the bottom configuration and to support common depth curves. "Joins" notes have been added to the smooth sheet to indicate the successful completion of these junctions.

There are two gaps in data between H10865 and H10880. One is in 100 to 150 fathoms water depth, 1,000 meters east of northern Lincoln Island, between Latitudes 58°30'00" N and 58°29'30" N, and between Longitudes 135°02'00" W and 135°01'30" W. The other is in over 200 fathoms water depth, 2,000 meters east of Hump Island between Latitudes 58°27'30" N and 58°26'45" N, and between Longitudes 135°02'00" W and 135°01'30" W. Comparison with prior survey H2056 (1890) and H4228 (1922) in these areas revealed no bottom features of significance that might pose a problem to surface navigation.

M. COMPARISON WITH PRIOR SURVEYS

The following prior surveys fall within the common area of the present survey and have been examined during office processing.

Survey	Year	Scale
H1602A	1884	1:40,000
H2056	1890	1:40,000
H3985WD	1917	1:20,000
H3986WD	1917	1:20,000
H4228WD	1922	1:40,000

Prior surveys H1602 and H2056 were conducted using leadline and visual positioning. H1602 appears to provide no source data on the current chart common to the survey area and has been superseded by survey work conducted from 1890 to 1922. The preponderance of charted soundings originate with prior survey H2056. This prior survey covers the entire current survey area. Digital comparison with H2056 shows poor shoreline alignment in some areas, but legibility is adequate. Registration was achieved by using rubber-sheeting techniques to align chart soundings with prior survey soundings. Differences in depths between the prior and present surveys generally range from 0-2 fathoms. Sounding differences of as much as 15 fathoms, both shoaler and deeper, were noted in some areas, and two 25-30 fathom discrepancies were found in one area south of the south tip of Lincoln

Island. The evaluator feels these larger differences are likely the result of erroneous leadline depths and /or positional errors. Smaller differences may be attributed to better bottom coverage, improved positioning and sounding techniques, and relative accuracy of the data acquisition methods. A more thorough coverage of the area utilizing the shallow water multibeam system (SWMB) has revealed significant shoal depths not detected during the earlier survey.

Survey H10865 is adequate to supersede these prior surveys within the common area.

Prior surveys H3985WD, H3986WD and H4228WD were conducted using wire drag techniques and leadline with visual positioning, and are the source for the charted green tint. H3985WD sparsely covers the eastern survey area, H3986WD the southeast part, and H4428WD the western part of the survey. Digital comparisons were made with these wire drag surveys, and registration and legibility were found to be marginal or poor. Shoreline alignment, where shoreline is shown, tends to be poor, and numeric data is sparse or non-existent. There was insufficient reliable information from these digital wire drag surveys to make definitive comparisons with current survey work. Assuming that all critical depths and clearances would have been previously transferred from the prior surveys to the chart, the chart functioned as a proxy for the surveys for the purpose of supersession analysis. Since the present survey data is consistently height quality and sufficiently dense to eliminate the possibility of any hazards to navigation remaining undetected, the prior wire drag surveys are considered to be superseded.

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

N. ITEM INVESTIGATIONS

There were two AWOIS items assigned for investigation within the survey area. The search for AWOIS 52407, a "Dangerous Wreck" charted at latitude 58°25'42"N, longitude 135°00'00" W, results in disproval of the item, and removal of the symbology from the chart. A full and sufficient search for this item was made in accordance with the survey requirements. The wreck symbol is charted in depths exceeding 200 fathoms and poses no threat to navigation.

Investigation of AWOIS 42406 results in the removal of a rock symbol charted at latitude 58°27'11"N, longitude 134°54'26"W. Symbology for a new reef, discovered at latitude 58°27'23"N, longitude 134°54'48"W, 500 meters northwest of the charted rock, will replace the rock symbol.

Additional information regarding item investigations is found in the hydrographer's report, section M.

O. COMPARISON WITH CHART

Survey H10865 was compared with the following chart.

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

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys and has been adequately addressed in section M of the evaluation report and in the hydrographer's report, section L. Comparison with the chart is discussed in the hydrographer's report, section N. No additional discussion is required.

The charted green tint represents wire-drag areas from surveys conducted from 1917 to 1922. The evaluator recommends removing the charted green tint based on more modern data acquisition techniques. See section M for a discussion pertaining to the supersession of the prior surveys considered to be the source of this tint.

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.

Survey H10865 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

The hydrographer during and following survey operations identified nine dangers to navigation. These dangers were reported to the USCG, NIMA, N/CS261, and N/CS34 on June 13, 1998 and on August 18, 1999. One additional danger to navigation found during office processing and reported on September 30, 1999 was later discovered to be a duplicate of a danger reported by the hydrographer.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H10865 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.

With the exception of the following, 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, the NOS Hydrographic Surveys Specifications and Deliverables, and the Field Procedures Manual, April 1998 Edition.

The following items regarding junctions are noted:

- 1) The junctions with H10680 and H10881 are excessive in extent. An adequate junction is affected when an overlap of at least one sounding line or equivalent distance is made with an adjoining survey except that, when the survey is continuous in the same year, by the same method, and by the same survey vessel, sounding overlaps are not required.
- 2) Two junctional data gaps exist between survey H10865 and H10880. The northernmost, east of northern Lincoln Island, is 600 meters by 600 meters in extent. The other, east of Hump Island, is 1600 meters by 250 meters in extent.

The following items regarding shoreline source are noted:

- 1) The hydrographer used an unauthorized source for shoreline. The Project Instructions, Change No. 1, dated March 30, 1998, directs use of photogrammetric digital maps GC10424 and GC10425, and analog maps TP01527 and TP01528 for compilation of shoreline.
- 2) For areas not common to the photogrammetric maps NOS nautical chart 17316, 18th edition, July 18th 1998, should be used. It is implicit that any deviation from Letter or Standing Project Instructions requires approval from Hydrographic Surveys Division.

The following items regarding Descriptive Report Appendices and Separates are noted:

- 1) During compilation of the appendices certain items were misplaced. The Tide Note was filed under Appendix IV: Geographic Names, instead of with the remaining related materials under V: Tides and Water Levels. Section VI: Supplemental Correspondence, contains GPS and echo sounder serial number lists, checkline tables and software lists in addition to correspondence.
- 2) References made in the Descriptive Report to "Separates" for the following items were not located. These appear to have not been included in the Report:
 - Reson SeaBat 8101 multibeam system serial number
 - SeaBeam 1050D MKII multibeam echosounder serial number
 - TSS335B attitude sensor serial number
 - Sperry MK227 gyro serial number
 - Listing of HPS tide tables

The following item regarding anomalous soundings is noted:

Some anomalous soundings were acquired during this survey. They appear to originate from the poor performance of the DXF 6000N vertical-beam echosounder on a steep slope, possibly surveyed at excessive vessel speed. The erroneous soundings occur in 50 to 120 fathoms water depth, 300 meters off the northwest coast of Hump Island in the vicinity of latitude 58°27'30" N, longitude 135°00'00" W. When compared to the SWMB and Rainer's multibeam hydrography also gathered in this area the soundings originating with the VBES are notably shoaler. The most erroneous of these soundings were excessed in MicroStation in order to maintain good agreement with surrounding soundings and to be consistent with bottom topography. Soundings in this area are in excess of 50 fathoms, and will have no negative effect on the quality of nautical charts compiled at scales smaller than 1:40,000.

Q. AIDS TO NAVIGATION

There were no fixed or floating aids to navigation within the survey area.

There were no features of landmark value located and or recommended for charting 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. No additional miscellaneous items were noted during office processing.

T. RECOMMENDATIONS

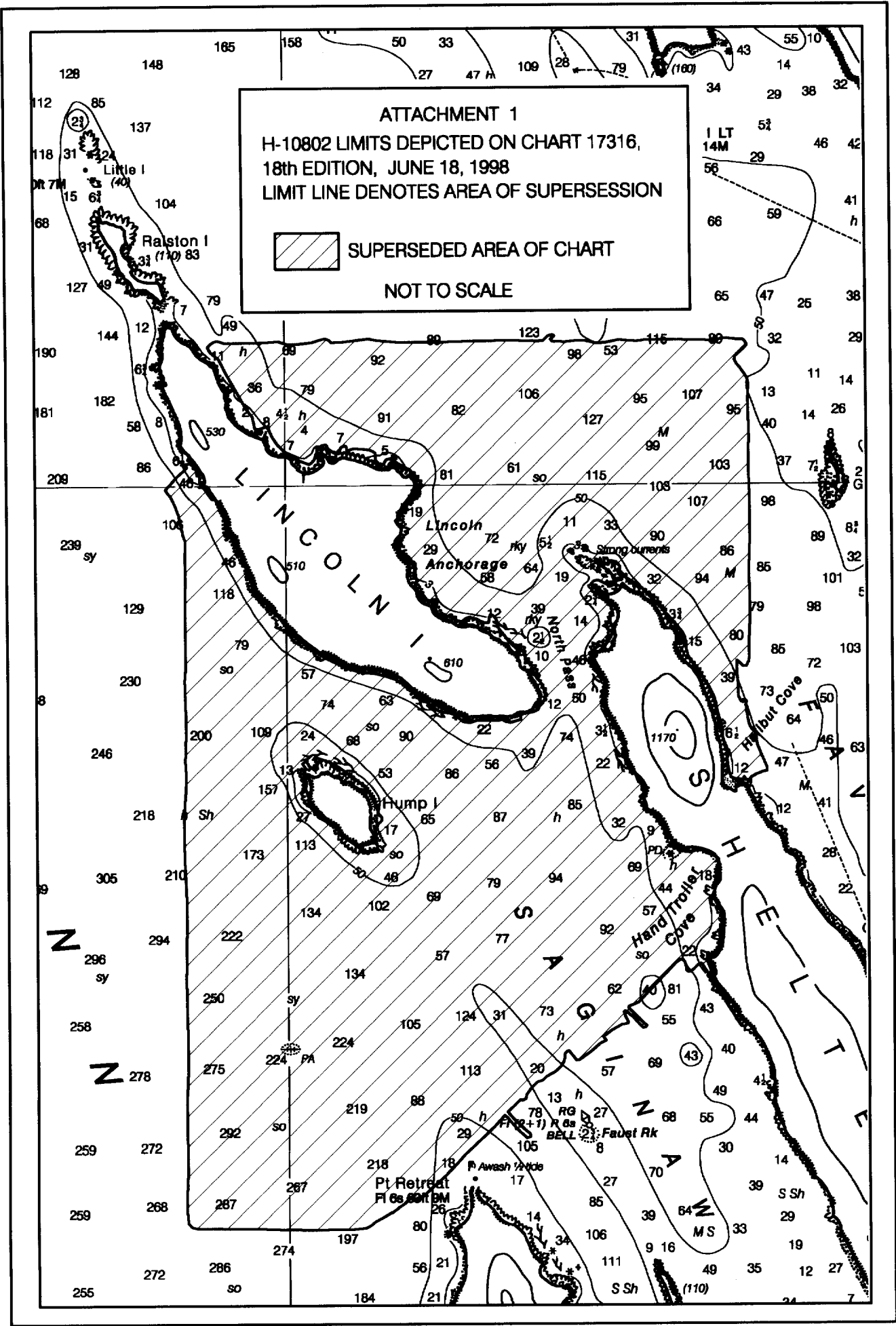
This is an adequate hydrographic survey. Additional work is recommended on a low priority basis to address the gaps in data between H10865 and H10880 as mentioned in section L.

U. REFERRAL TO REPORTS

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




CJ Barry
Cartographer



APPROVAL SHEET
H-10865

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 disproval of charted data. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.



Dennis Hill
Chief, Cartographic Team
Pacific Hydrographic Branch

Date: 5-24-00

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: 5-31-00

Final Approval

Approved:



Samuel De Bow
Edr, NOAA
Chief, Hydrographic Surveys Division

Date: July 23, 2000

