H10879

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-10-08-99

Registry No.: H-10879

LOCALITY

State: Alaska

General Locality: Lynn Canal

Sublocality: Funter Bay and Vicinity

1999

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

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DATE

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

HYDROGRAPHIC TITLE SHEET

H-10879

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-10-08-99

State: Alaska

General locality: Lynn Canal

Locality: Funter Bay and Vicinity

Scale: 1:10,000 Date of survey: 5/1/99 - 6/6/99

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, ~~hand lead, pole~~ DSF-6000N,Knudsen 320M,RESON 8101 MB, SeaBeam 1050D MKII (Low Frequenty)

Graphic record scaled by: RAINIER Personnel

Graphic record checked by: RAINIER Personnel

Evaluation by: ~~Protracted by~~ L. Deodato Automated plot by: HP 750C

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

Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and tenths

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 / SUKF 7/18/00 mcR

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

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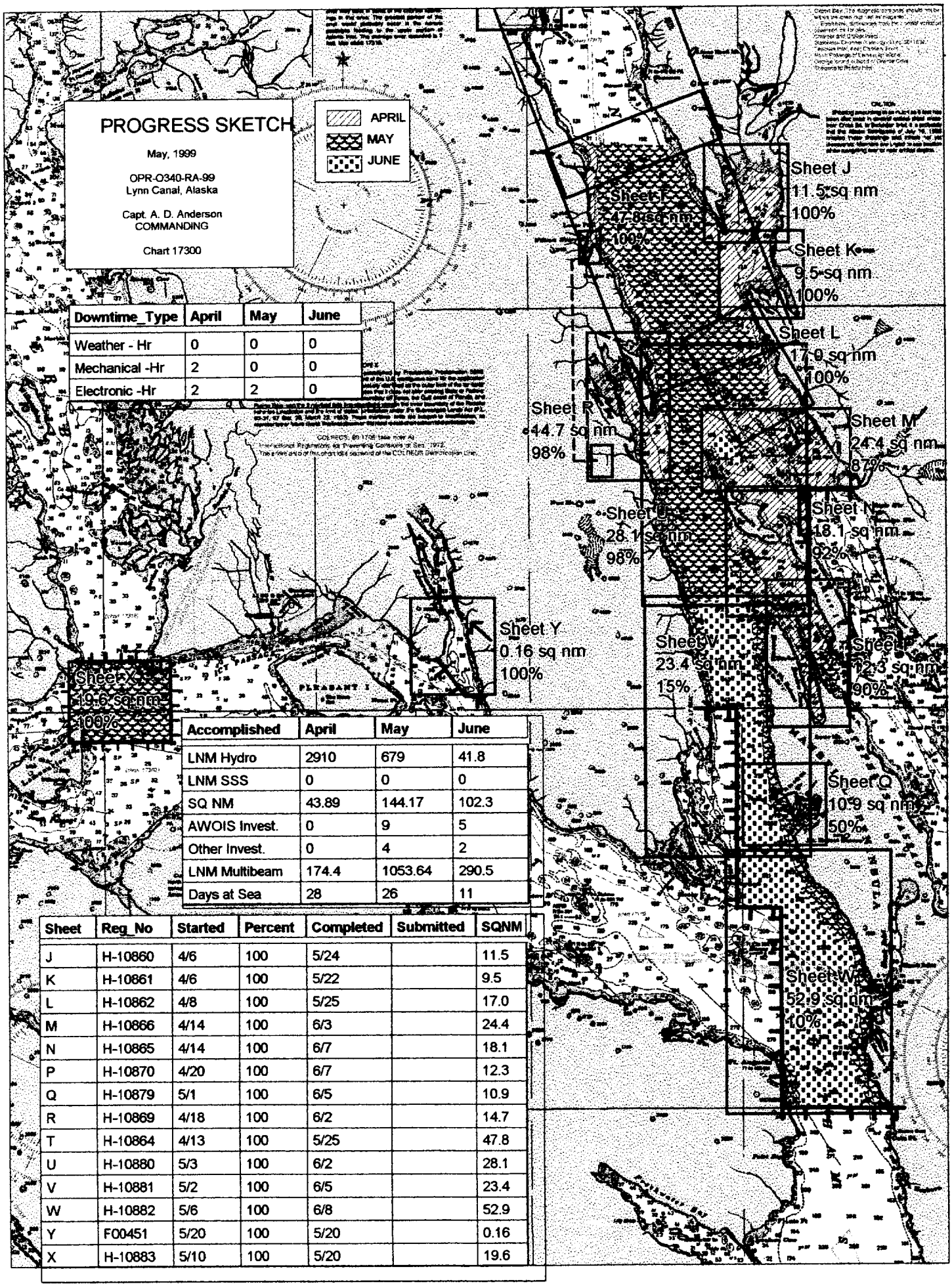
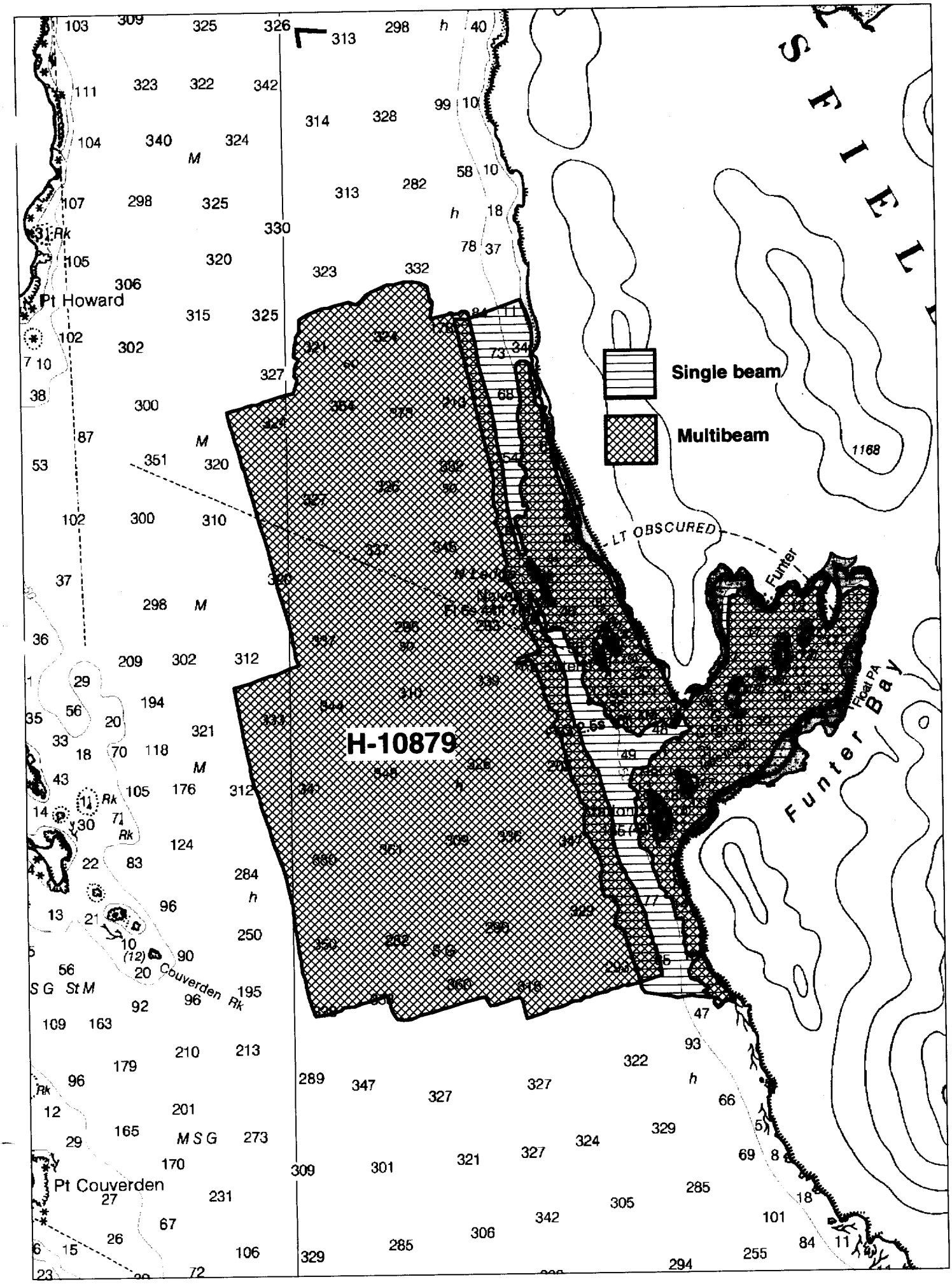


Downtime_Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	2	0	0
Electronic -Hr	2	2	0

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


H-10879
Single beam
Multibeam
LT OBSCURED
Pt Howard
Pt Couverden
Couverden Rk
Funter Bay
Funter I.
Float PA
1168

Descriptive Report to Accompany Hydrographic Survey H10879

Field Number RA-10-8-99
Scale 1:10,000
May-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 H10879 corresponds to Sheet Q (Sheet 07 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 Rpt., section B

The survey area is located in Lynn Canal, Alaska covering Funter Bay and the surrounding area. Survey limits are depicted below in Figure 1. The survey's northern limit is latitude 58°17'12"N to the shoreline and the southern limit is latitude 58°13'05"N to the shoreline. The surveys eastern limit is the shoreline and the western limit is longitude 134°59'56"W. Data acquisition was conducted from May 1 to June 6, 1999 (DN 121 to 157).

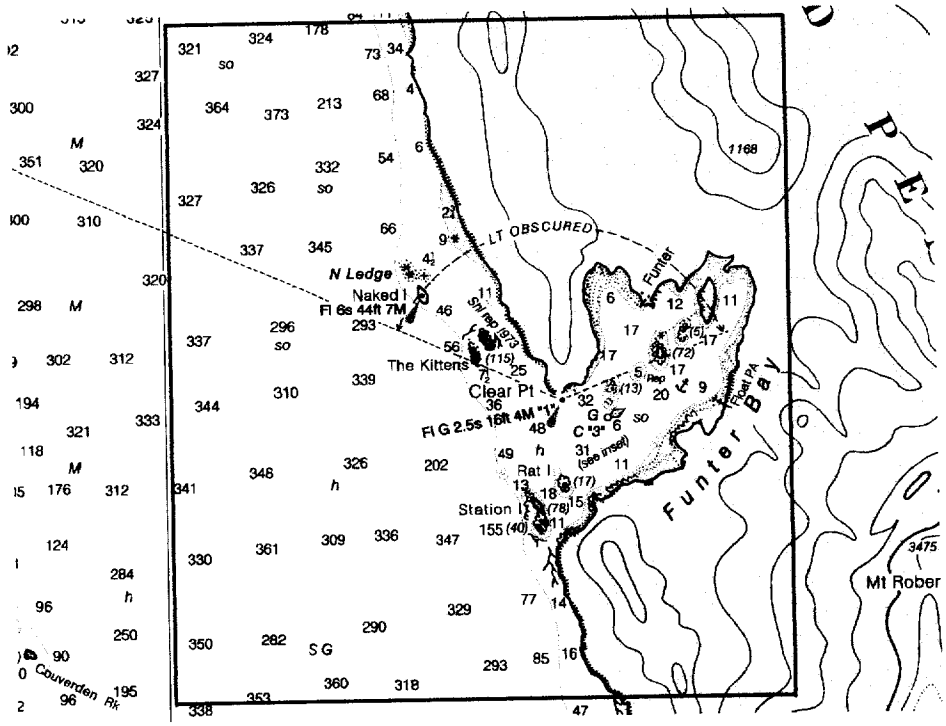


Figure 1. Survey Limits of H10879 in blue.

C. SURVEY VESSELS ✓

Data was 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 during this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All vertical beam echo sounder (VBES) data was 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 Triton Elics ISIS version 4.32 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. Filed with the hydrographic data.

E. SONAR EQUIPMENT ✓

Side Scan Sonar (SSS) equipment was not used on this survey. However, it should be noted that the Reson SeaBat 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, bottom topography, 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)

Vertical beam echosounders (VBES) utilized for this survey were the Raytheon DSF-6000N and Knudsen 320M, which are dual frequency (100 kHz, 24 kHz) digital recording echosounders with analog paper traces. Soundings were acquired in meters using the High + Low, high frequency digitized setting. 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 MKII 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. *Filed with the hydrographic data.*

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 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. *Filed with the hydrographic data.*

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 singlebeam 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. Filed with the hydrographic data.

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 H10879 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 ✓

Eleven sound velocity casts were used for this survey: eight for the Reson 8101 SWMB, two for SeaBeam 1050D MKII, and one for VBES. 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 with SBE SEACAT Profilers (S/N 219 and 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.

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

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

* Filed with the hydrographic data.

(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, User Services Branch (N/CS41), supplied no predicted tides for OPR-O340-RA-99. Preliminary predicted tide tables were generated for both HPS and CARIS using Tides & Currents v2.5. Tide correctors for H10879 were based on the location William Henry Bay, Lynn Canal (945-1705) that uses Juneau (945-2210) as a reference station. Tide table HPS #99 was used only for preliminary inspection of the VBES soundings. CARIS tide tables funter.tid and juneau99new.tid were also based on Tides & Currents and were 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 H10879 are included in the Separates of this report. Tidal correctors as provided in the Project Instructions for H10879 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 gauge at Funter Bay (945-2321) on April 29, 1999. The gauge was removed on May 9, 1999. Refer to the Field Tide Notes and supporting data in Appendix V for gauge 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.

* Filed with the hydrographic data.

H. HYDROGRAPHIC POSITION CONTROL ✓ See Eval Rpt., section I.

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

All hydrographic features were positioned using differential GPS (DGPS). VHF reference stations were set up at stations JOE and CURTIS. Due to it's proximity to the H10879 survey area, station JOE 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 weekly 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 Rpt., section J.

Method of Shoreline Verification

✓ Do not concur, GC 10425 and GC 10426 was provided in MapInfo format.

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 H10879. This problem was resolved by registering NASA aerial photos acquired from the U.S. Forest Service. These 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. In the field ledges and rocks were extensively DP'd to field check the NASA photo's registration. 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 29 into MapInfo.

Location	Point #	Latitude	Longitude
Southwest point of Crab Cove	1	58°15'08"N	134°53'05"W
West island of the Kittens	2	58°14'55"N	134°56'06"W
Symonds Point	3	58°20'34"N	134°50'17"W
Piling Point	4	58°19'20"N	134°48'18"W
Southeast corner of Funter bay	5	58°14'27"N	134°53'17"W

* Filed with the hydrographic data.

Shoreline verification was conducted 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. 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 "Shoreline" and "Shoreline_Update") and final sounding plot be used to supercede shoreline information compiled on the digitized NASA photos. Do not concur.

Charted Features

Charted rocks were often identified as DM rocks, high points or extensions of DM ledges or reefs.

Star Rock, located north of Gauge Island at 58°15'59"N, 134°53'41"W, was found 60m to the southeast of its charted position. Positions 20174 and 20176 define the northwest and southeast extent of this rock. ✓concur T-sheet position is shown on SS.

✓The charted rock at 58°15'28"N, 134°56'40"W (Pos. #20923) was not found. A new reef was found approximately 70m north, defined by Pos. # 20920-20922. This feature is discussed in Section M, Item Investigation Report, AWOIS 52415.

✓The charted rock atop Curlew Ledge was found 60m to the southeast, at 58°14'35.07"N, 134°54'24.89"W (Pos. #40001). The ledge was defined by VBES hydrography.

✓A charted float PA (AWOIS 52414) was found and defined by positions 20027, 20028. This feature is discussed in Section M, Item Investigation Report.

✓A new float (approximately 2 x 5m) was located within Crab Cove, at 58°15'24.14"N, 134°52'48.24"W (Pos. #20065).

✓New ruins were discovered within Crab Cove, at 58°15'19.10"N, 134°52'55.91"W (Pos. #20073). The ruins consist of metal tubing, and miscellaneous metal debris.

✓A new wreck was located on the northwest side of Ledge Island at 58°15'26.58"N, 134°53'14.32"W (Pos. #20096). Assigned AWOIS #52588 - mcr 7/17/00

✓A row of 13 piles was found northeast of Funter, at 58°15'23.80"N, 134°53'36.24"W. The east and west extent of these piles are defined by positions 20697-20698.

A new mooring buoy was found in the cove northeast of the cannery at Funter, at 58°15'21.46"N, 134°53'40.14"W (Pos. #20119). The mooring buoy is approximately 40m from shore, and is privately maintained.

A group of 7 piles near the cannery at Funter were discovered at 58°15'21.77"N, 134°53'48.44"W. The extent of the piles are defined by positions 20642-20643.

New ruins were found at 58°15'15.08"N, 134°53'49.74"W (Pos. #20115), just east of Coot Cove. The ruins consisted of machinery debris, at the seaward extent of a charted pier, which is either no longer there or incorrectly charted. These ruins most likely correspond to the submerged ruins incorrectly charted inside of Coot Cove. A floating pier was located to the northeast, defined by positions 20116-20118.

A 400 m extent of eastern shoreline near the southern limit of the survey was observed 40 m inland of what is charted. These observations extend from 58°12'50"N, 134°54'43"W to 58°13'07"N, 134°54'43"W. Do not concur. Shoreline from GC10426 is shown on SS.

The charted shoreline should be revised using the manuscript shoreline and fieldwork notes as recorded in the MapInfo digital files named "Shoreline" and "Shoreline Update". Do not concur. Shoreline from GC10425 and GC10426 is shown on SS.

J. CROSSLINES ✓

VBES crosslines agreed within 1 meter with mainscheme hydrography in regions of relatively flat bathymetry. Crosslines totaled 14.26 nautical miles, comprising 19.6% of mainscheme hydrography. SWMB crosslines generally agreed to within 0.1 meters with mainscheme SWMB hydrography. VBES and SWMB data agree to within 1 meter of one another in areas with low vertical gradients. SeaBeam and VBES tended to agree within 2 meters of each other in regions of low vertical gradients. These differences between the two methods of surveying are a function of horizontal positioning, beam width, water depth, slope, and echo return processing.

The Quality Control Report (CARIS-HIPS) for the checkline file averaged **99.17%** with a depth tolerance of 0.023. See Appendix VI for detailed report.

K. JUNCTIONS ✓ See Eval Rpt., section L.

The following contemporary surveys junction with H10879 and are shown in Figure 2 below.

Registry #	Scale	Date	Junction Area
H10881	1:20000	1999	West
H10882	1:20000	1999	South

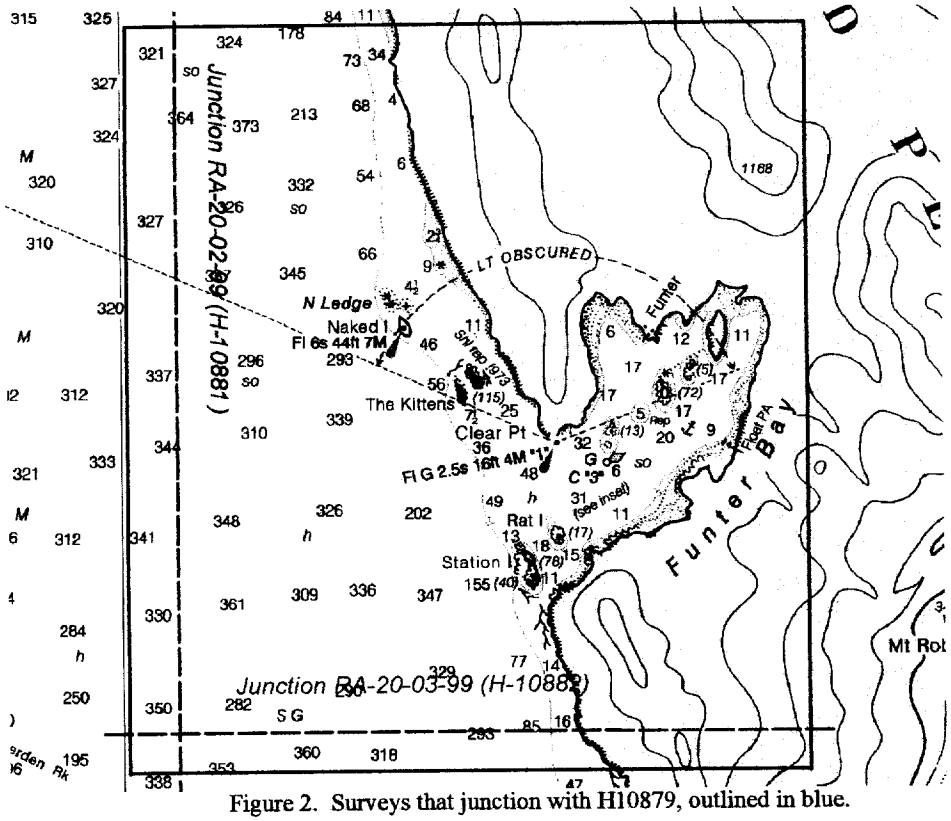


Figure 2. Surveys that junction with H10879, outlined in blue.

Soundings from junction surveys H10881 and H10882 were found to be in good agreement, matching within 1 meter, in depths shoaler than 150 meters. In deeper waters (200-300 meters), the difference between soundings increased to between one and five meters. Most of the differences were within 2 meters but no other patterns were observed. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after application of smooth tides. Concur.

L. COMPARISON WITH PRIOR SURVEYS ✓ See Eval Rpt, section M.

Four prior surveys were compared to survey H10879 and are shown in Figure 3 below.

Registry #	Scale	Date	Region
~~H1602a~~	~~1:40000~~	~~1884~~	~~Eastern shoreline~~
H2055	1:80000	1890	Surrounding area outside Funter Bay
H2062	1:10000	1890	Funter Bay
H4228	1:40000	1922	Eastern shoreline
~~17316 (inset)~~	~~1:20000~~	~~18th~~	~~NAD 83~~

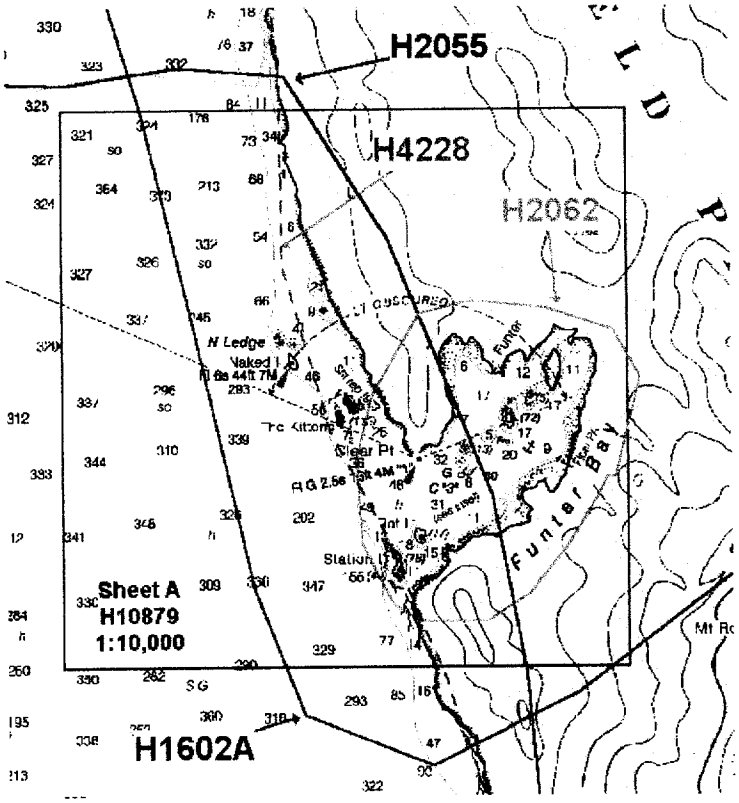


Figure 3. Prior surveys covering H10879 outlined in blue.

Shoreline detail on survey H1602a was poor, and no soundings fell within the Funter Bay area. H1602a depicts the shoreline outside the Funter Bay area in a northeastern direction, whereas that shoreline is actually northwesterly. Naked Island, the Kittens, and Station Island are misplaced; Ledge Island, Gauge Island, and Bare Island are missing altogether. One major disagreement is a hand-written note of "No anchorage here" within the Funter Bay sketch. Since no soundings appear to have been taken in this area, the Hydrographer assumes the shoreline on H1602a was determined by visual inspection only.

H2055 has mid-channel soundings 5 to 15 fathoms deeper than soundings from H10879. This difference diminishes in water shoaler than 100 fathoms; depths between surveys are within one fathom in this area. Two exceptions include the area between the Kittens and the mainland and the area northeast of Naked Island. These items are discussed in Section M, under AWOIS 52411. copy attached

H2062 survey soundings were found to be in good agreement with those from the current survey. Least depths from the survey H10879 were in agreement with, or shoaler than, prior survey H2062.

A comparison of the H10879 current survey with survey H4228 was not conducted. The H4228 scan was of very poor quality; no least depths were discernible and annotations on the prior were illegible. A color presentation of H4228 was also illegible.

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

M. ITEM INVESTIGATION REPORTS

There were five AWOIS items assigned for survey H10879.

AWOIS 52411

1. Area of Investigation:

AWOIS Number: 52411 State and Locality: Lynn Canal, Alaska
Reported Position: Latitude: 58/15/07.78N Longitude: 134/55/48.46W Datum: NAD83
Type of Feature: Shoaling between Kittens and Mainland Reported Depth: 5-8 fathoms

2. Description and Source of Item:

History
CL1247/73 – USC&GS Ship FAIRWEATHER LTR; Shoaling 5-8 fathoms reported 1973, between the Kittens and the mainland. Five fathom peak to the northwest.
CL1584/73 - USC&GS Ship FAIRWEATHER LTR; 5 fathom depth scaled from chart section provided in LAT 58/15/05N, LONG 134/55/42W (NAD27). Echogram submitted. Controlled by dead reckoning. (Entered 8/98 RWD).

3. Survey Requirements:

Singlebeam echosounder investigation; Shallow water multibeam investigation; 200% side scan sonar.

4. Method of Investigation:
Vessels 2121 and 2124 investigated the area on DN 121, 122, 126 and 129 using a singlebeam echosounder and shallow water multibeam.

5. Results of Investigation:

A significant amount of shoaling was found between the mainland and the Kittens, extending 200 meters offshore from the mainland. The northwest-southeast extent spans 800m and depths range from 3-8 fathoms.

6. Comparison with Prior Surveys:

Prior surveys showed no indication of shoaling between the Kittens and the Mainland.

7. Comparison with the Chart and Charting Recommendation:

AWOIS 52411 was compared to chart 17316 (1:80,000, 18th Edition, 7/18/98), 17316 inset (1:20,000, 18th Edition, 7/18/98). The shoaling extent was submitted as a Danger to Navigation on June 13, 1999 (Pos. #73614, 73649, 74502, 74618). A copy of the Danger to Navigation Report is included in Appendix A.

The Hydrographer recommends the charted "Shoaling from 5 to 8 fathoms reported 1973" east of the Kittens be deleted and replaced with depths from the current survey. concur.

Figure 4 below depicts the extent of shoaling determined by the current survey, and Dangers to Navigation submitted on the shoaling.

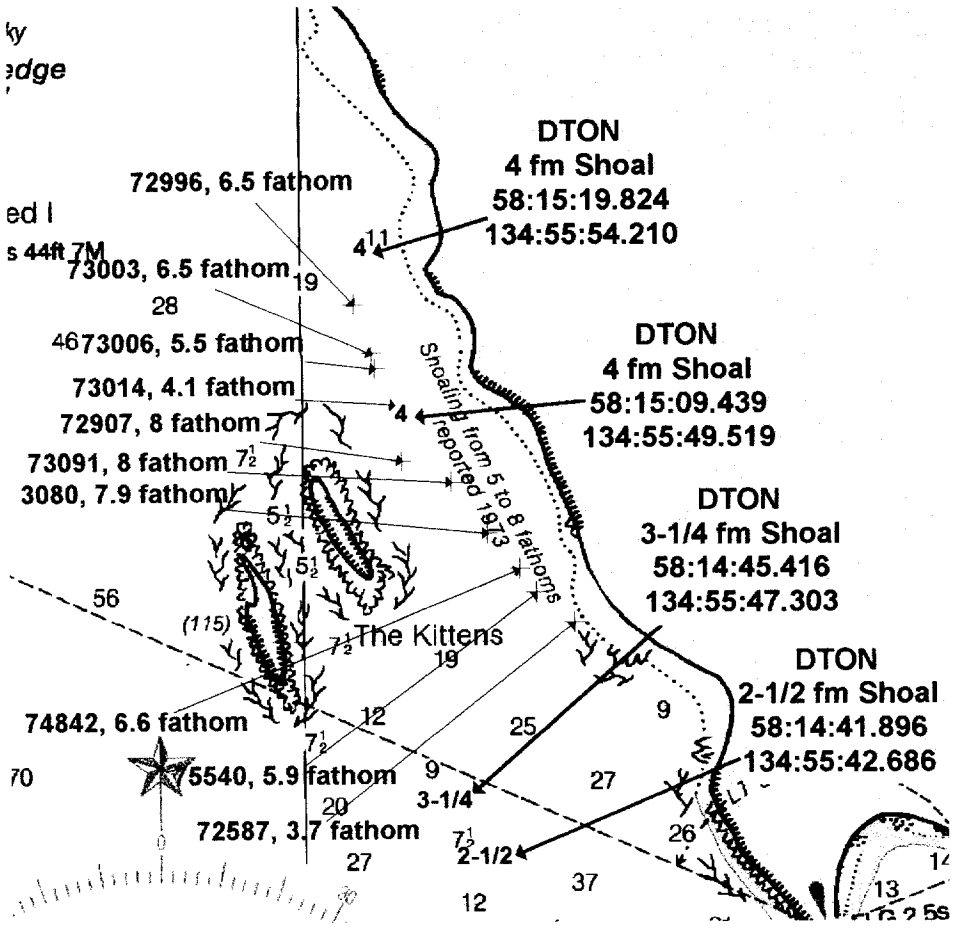


Figure 4. AWOIS 52411 Investigation
Shoal Limits and DTONs

AWOIS 52412

1. Area of Investigation:

AWOIS Number: 52412 State and Locality: Lynn Canal, Alaska
Reported Position: Latitude: 58/14/29N Longitude: 134/54/22W Datum: NAD83
Type of Feature: Sounding Reported Depth: 6 fathoms

2. Description and Source of Item:

History
CL1247/73 – USC&GS SHIP FAIRWEATHER LTR; 6 fm depth found in Funter Bay, position scaled from chart in LAT58/14/29N, LONG 134/54/22W (NAD83).
CL1584/73 - USC&GS SHIP FAIRWEATHER LTR; Reports above. Controlled by visual bearings. (Entered 8/98 RWD)

3. Survey Requirements:

Singlebeam echosounder investigation; Shallow water multibeam investigation; 200% side scan sonar. 100 meter search radius.

4. Method of Investigation:

Vessel 2124 and 2126 investigated the area on DN 121 and 126 using a singlebeam echosounder and shallow water multibeam.

5. Results of Investigation:

Current survey found a least depth of 3.6 fm (6.6m) at 58°14'29.62"N, 134°54'21.72"W (Pos. #73614).

6. Comparison with Prior Surveys:

Prior surveys showed no indication of the 6 fathom depth.

7. Comparison with the Chart and Charting Recommendation:

AWOIS 52412 was compared to chart 17316 (1:80,000, 18th Edition, 7/18/98), 17316 inset (1:20,000, 18th Edition, 7/18/98). The shoaling was submitted as a Danger to Navigation on August 15, 1999 (Pos. #73614). A copy of the Danger to Navigation Report is included in Appendix A.

The Hydrographer recommends deleting the charted 6 fm depth and using present survey depths in the common area. Concur Figure 4 below depicts AWOIS 52412.

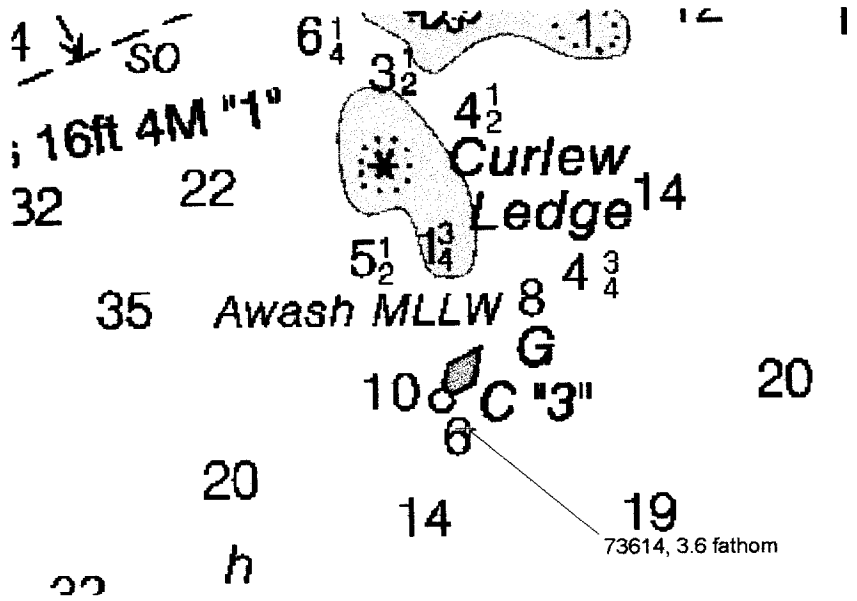


Figure 5. AWOIS 52412 Investigation

AWOIS 52413

1. Area of Investigation:

AWOIS Number: 52413 State and Locality: Lynn Canal, Alaska
Reported Position: Latitude: 58/14/49N Longitude: 134/54/04.0W Datum: NAD83
Type of Feature: Sounding Reported Depth: 5 fm

2. Description and Source of Item:

History
CL14/92 – USCGC NAUSHON; 5 fm depth reported, position given in LAT 58/14/49N, LONG 134/54/04W (NAD83), determined by radar and GPS. Vessel not equipped with recording echosounder.
LNM 9/92 (2/26/92) – 17th CGD; Reports same. (Entered 8/98 RWD).

3. Survey Requirements:

Singlebeam echosounder investigation; Shallow water multibeam investigation; 200% side scan sonar. 100 meter search radius.

4. Method of Investigation:

Vessel 2122 and 2126 investigated the area on DN 121 and 126 using a singlebeam echosounder and shallow water multibeam. Search radius was 130 m.

5. Results of Investigation:

Current survey found depths of 8-10 fathoms in the vicinity of the 5 fathom reported depth.

6. Comparison with Prior Surveys:

Prior surveys showed no indication of the reported shoaling.

7. Comparison with the Chart and Charting Recommendation:

AWOIS 52413 was compared to chart 17316 (1:80,000, 18th Edition, 7/18/98), 17316 inset (1:20000, 18th Edition, 7/18/98). Approximately 250m to the southeast of the 5 fathom sounding, shoal depths were found to extend south of Gauge Island. The current survey found depths of 3.4-7.9 fathoms (6.3-14.6m), where the chart shows 13 fathoms. A Danger to Navigation was submitted on June 13, 1999 for a 3 ¼ fathom (6.3m) shoal at 58°14'47.757N, 134°53'47.436W (Pos. #50683). A copy of the Danger to Navigation Report is included ~~in Appendix A~~. *Copy attached.*

The Hydrographer recommends deleting the charted 5 fm depth and using present survey depths in the common area. *Concur.*

Figure 6 below depicts AWOIS 52413 and current survey least depth.

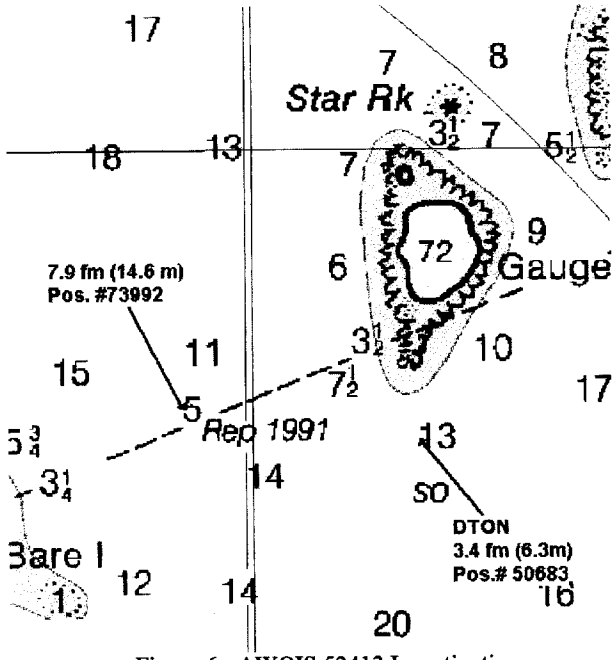


Figure 6. AWOIS 52413 Investigation

AWOIS 52414

1. Area of Investigation:

AWOIS Number: 52414 State and Locality: Lynn Canal, Alaska
Reported Position: Latitude: 58/14/49N Longitude: 134/53/00W Datum: NAD83
Type of Feature: Small boat float - PA Reported Depth: N/A

2. Description and Source of Item:

History
CL871/51 – USACE Permit LTR – Small boat float, position scaled from chart in LAT 58/14/38N, LONG 134/53/00W (NAD83).
CL1825/76 – CPR; Float is 10x150 ft long. (Entered 8/98 RWD)

3. Survey Requirements:

Visual search; Singlebeam echosounder investigation; Shallow water multibeam investigation; 200% side scan sonar; Dive investigation.. 100 meter search radius.

4. Method of Investigation:

Vessel 2122 investigated the area on DN 121 by singlebeam echosounder and a visual search.

5. Results of Investigation:

Extent of small boat float confirmed at 58°14'37.675"N, 134°52'58.475"W (Pos. #20027) and 58°14'36.261"N, 134°53'00.095"W (Pos. #20028).

6. Comparison with Prior Surveys:

Prior surveys revealed no indication of the small boat float.

7. Comparison with the Chart and Charting Recommendation:

AWOIS 52414 was compared to chart 17316 (1:80,000, 18th Edition, 7/18/98), 17316 inset (1:20000, 18th Edition, 7/18/98). The chart currently depicts a float PA, approximately 30m offshore from the survey position. The size of the float depicted on the chart is approximately 20m x 130m, while the current survey determined that the float is approximately 3m x 50m.

The Hydrographer recommends charting a small boat float at positions determined on survey H10879. Concur

Figure 7 below depicts AWOIS 52414 and its new position.

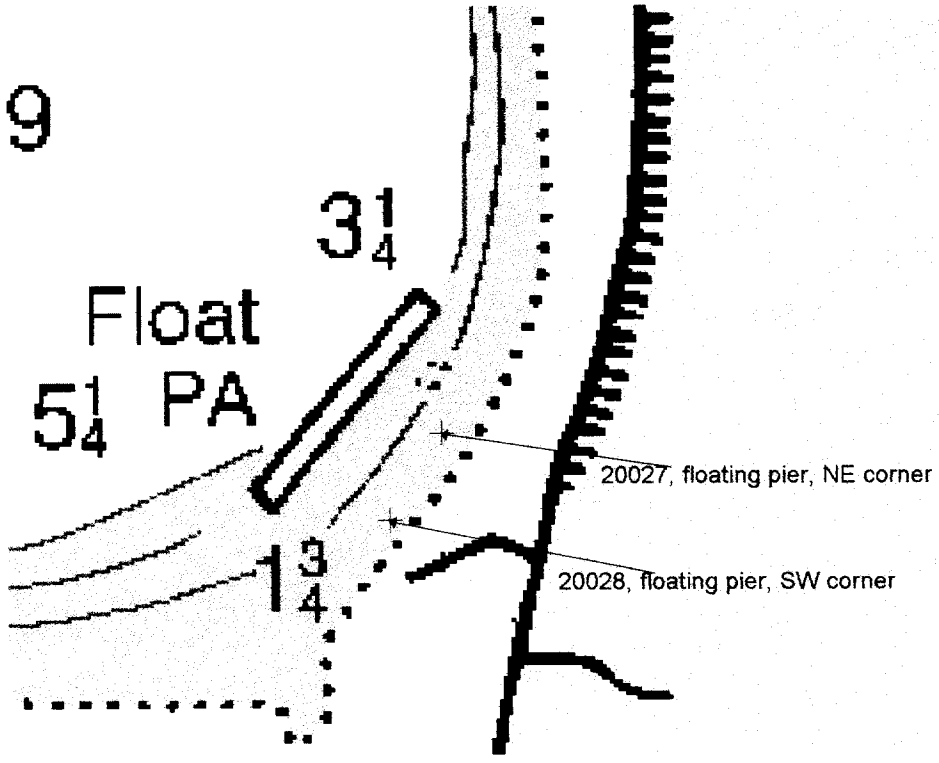


Figure 7. AWOIS 52414 – Small Boat Float

AWOIS 52415

1. Area of Investigation:

AWOIS Number: 52415 State and Locality: Lynn Canal, Alaska
Reported Position: Latitude: 58/15/27.7N Longitude: 134/56/40.6W Datum: NAD83
Type of Feature: Submerged rock Reported Depth: 14.5 ft

2. Description and Source of Item:

History
CL284/37 – DOC – LTR; Lighthouse tender CEDER with 14.5 ft draft touched bottom with no damage. Reported rock position scaled from chart in LAT 58/15/27N, LONG 134/56/40.6W (NAD83).
LHNM18/37 (759) – 5/5/1937; Rock reported 260 yards 14 deg from Naked Island light. (Entered 8/98 RWD)

3. Survey Requirements:

Singlebeam echosounder investigation; Shallow water multibeam investigation; Bottom drag; Dive investigation.. 100 meter search radius

4. Method of Investigation:

Vessel 2122 investigated the area on DN 122 by singlebeam echosounder and leadline.

5. Results of Investigation:

A new reef was found approximately 50 m north of a charted rock (charted rock disproved, Pos. #20923 – see Section I, Shoreline); The reef is defined by the following; 58°15'30.539"N, 134°56'40.555"W (Pos. #20922 – southern extent); 58°15'33.950"N, 134°56'41.022"W (Pos. #20920 – center position); 58°15'34.956"N, 134°56'41.082"W (Pos. #20921 – northern extent). A 1.5m least depth was obtained by leadline.

6. Comparison with Prior Surveys:

There was no indication of the charted rock or new reef on prior surveys.

7. Comparison with the Chart and Charting Recommendation:

AWOIS 52415 was compared to chart 17316 (1:80,000, 18th Edition, 7/18/98), 17316 inset (1:20,000, 18th Edition, 7/18/98). The chart depicts a dangerous rock awash at high water, and a 4 ½ fathom sounding 150m north-northwest of the rock. The new reef is 60m north of the rock, and 40m east of the 4 ½ fathom sounding. Due to its proximity to the charted dangerous rock, this feature was not submitted as a Danger to Navigation.

The Hydrographer recommends deleting the charted rock and 4 ½ fm sounding and charting a new reef defined by positions 20920, 20921 and 20922. Concur

Figure 8 below depicts AWOIS 52415 and the new reef limits.

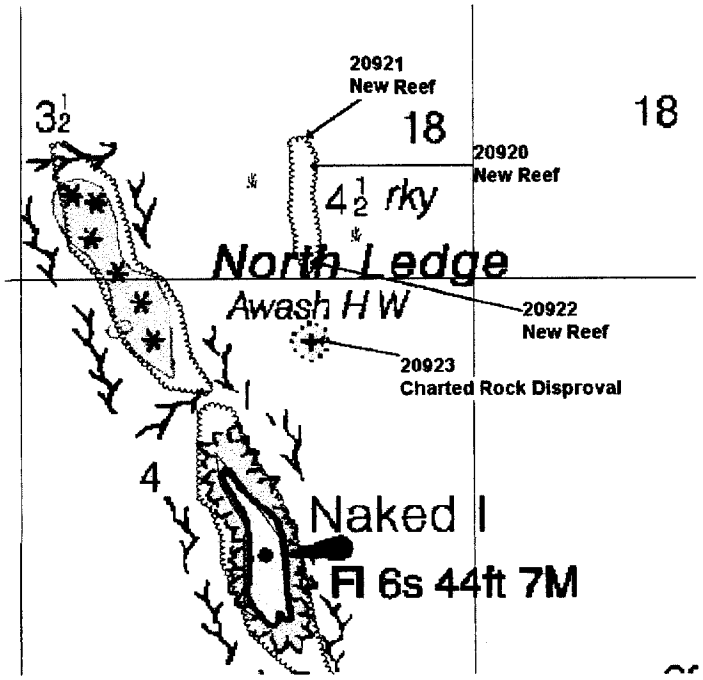


Figure 8. AWOIS 52415 and New Reef

N. COMPARISON WITH THE CHART ✓ See Eval Rpt., section O.

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

Chart	Scale	Edition Number	Date	Datum
17316	1:80000	18th	July 18, 1998	NAD 83
17316 (inset)	1:20000	18th	July 18, 1998	NAD 83

The survey was compared with chart 17316 (see Figure 1) and was in good agreement, generally within one to two fathoms. The surveys which form the basis for depths on chart 17316 originated from sounding and positioning methods less accurate and comprehensive than current methods. Most all soundings from the current survey were in agreement with, or shoaler than, charted depths. Exceptions were noted in areas of steep relief.

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

Dangers to Navigation

Eight dangers to navigation were discovered during the survey and reported to the Seventeenth Coast Guard District on June 13, 1999. ~~Refer to Appendix I for more information~~. copy attached.

Four Dangers to Navigation were submitted between the Kittens and the Mainland, in the area where chart 17316 shows a note "Shoaling from 5 to 8 fathoms reported 1973". The four dangers are: 4 fathom shoal at 58°15'19.824"N, 134°55'54.210"W (Pos. #74502); 4 fathom shoal at 58°15'09.439"N, 134°55'49.519"W (Pos. #73614); 3 ¼ fathom shoal at 58°14'45.416"N, 134°55'47.303"W (Pos. #74618); 2 ½ fathoms at 58°14'41.896"N, 134°55'42.686"W (Pos. #73649). The position numbers listed in the danger letter are

different due to re-numbering.

A 6 ½ fathom shoal was discovered just south of Clear Point at 58°14'34.097"N, 134°54'59.502"W (Pos. #72348). A 12 fathom depth is depicted on chart 17316 at this location. This item was reported as Pos. # 2349 in the Danger to Navigation letter. The difference in fix numbers is due to re-numbering after submission to the Coast Guard.

A 3 1/4 fathom shoal was discovered south of Gauge Island at 58°14'47.757"N, 134°53' 47.436"W (Pos. #50683). Chart 17316 shows a 13 fathom depth near this position..

A 5 fathom shoal was discovered on the south side of Funter Bay, southeast of Bare Island and Curlew Ledge at 58°14'25.285"N, 134°53'51.867"W Pos. #72883). Chart 17316 shows 6 ½ to 10 fathom depths near this position. This item was reported as Pos. # 2884 in the Danger to Navigation letter. The difference in fix numbers is due to re-numbering after submission to the Coast Guard.

A 2.5 fathom shoal was discovered south of Station Island at 58°13'41.092"N, 134°55'21.337"W (Pos. #40920). Chart 17316 shows an 11 fathom depth near this position.

One additional dangers to navigation was discovered during further post processing, and reported to the Seventeenth Coast Guard District on August 15, 1999. ~~Refer to Appendix I for more information~~. copy attached.

A 3 ½ fathom shoal was discovered south of Curlew Ledge at 58°14'29.62"N, 134°54'21.72"W (Pos. #73614). Chart 17316 (Inset) shows a 6 fathom depth at this location.

O. ADEQUACY OF SURVEY ✓ See Eval Rpt., section P.

Survey H10879 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 DN 126 using static GPS methods: Naked Island Light (Light List #23970) and Funter Bay Entrance Light 1 (Light List #23975). The lights are charted adequately on chart 17316. Additional information is contained in Appendix II of this report.

One floating aid to navigation was positioned using DGPS:

Funter Bay Buoy #3
G C "3"
Position number: 41062

Light List #23980
Check Position number: 41184

	Latitude	Longitude
Charted Position:	58°14'30.50"N	134°54'22.8"W
Survey Position:	58°14'31.39"N	134°56'17.08"W

	Easting	Northing
Charted Position:	505499.2	6455635.5
Survey Position:	505592.4	6455663.1

The buoy's characteristics match the Light List characteristics. The aid adequately serves its purpose, which is to mark the location of a rock. The aid is maintained by the USCG.

Q. STATISTICS

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

R. MISCELLANEOUS

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

Commercial fishing boats and innumerable pleasure craft have been seen throughout this area. The southwest area of Funter Bay provides a good place for anchorage. Small boats can also find anchorage in Coot and Crab Coves. Two 150-foot small craft floats are maintained by the State in Funter Bay; one float for seaplanes is located east of Coot Cove, and the other is on the southeast side of the bay.

S. RECOMMENDATIONS

GC10425 and GC10426 were provided in MapInfo format.

Because no photogrammetric shoreline was provided for the entire survey area, the Hydrographer recommends that shoreline depicted on Survey H10879 be used to update the chart in their common areas. Do not concur. Precise, low-water shoreline information is imperative when conducting basic hydrographic surveys along the complex Alaska coast. When shoreline manuscripts are not provided, significant 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:

Title	Date Sent	Office
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,

ENS/NOAA

Angie J. Venturato
Ensign, NOAA
Junior Officer

Approved and Forwarded,

CDR/NOAA

Alan D. Anderson
Captain, NOAA
Commanding Officer

for

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

Section P: Descriptive Report Insert

Name of Aid: Naked Island Light
Light List #: 23970

Method of Positioning Static GPS: [X] DGPS: [ ] Other: _____

Positioning Information

	Latitude (N)	Longitude (W)
Charted Pos.	58/15/20.5	134/56/43.7
Survey Pos.	58/15/20.45	134/56/43.80

	Easting	Northing
Charted Pos.	503200.1	6457179.3
Survey Pos.	503198.5	6457177.7

Difference between Charted and Surveyed Position: Distance: 2 meters
(Bearing from Surveyed to Charted Position) Bearing: 45 deg T

Characteristics
Do characteristics match Light List? Yes [X] No [ ]
If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes [X] 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.

Section P: Descriptive Report Insert

Name of Aid: Funter Bay Entrance Light 1
Light List #: 23975

Method of Positioning Static GPS: [X] DGPS: [ ] Other: _____

Positioning Information

	Latitude (N)	Longitude (W)
Charted Pos.	58/14/38	134/55/01
Survey Pos.	58/14/36.83	134/54/59.54

	Easting	Northing
Charted Pos.	504875.9	6455866.6
Survey Pos.	504899.8	6455830.4

Difference between Charted and Surveyed Position: Distance: 43 meters
(Bearing from Surveyed to Charted Position) Bearing: 327 deg T

Characteristics
Do characteristics match Light List? Yes [X] No [ ]
If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes [X] 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:

Funter Bay Entrance Light 1 has an obscured sector as depicted on the chart. The obscured sector was not investigated during survey operations. The Hydrographer recommends that the designation of LT OBSCURED remain as depicted on the chart.

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

Survey Information Summary

Project: OPR-O340-99 **Project Name:** LYNN CANAL

Instructions Dated: 3/5/98 **Project Change Info:**

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

Sheet Letter: Q **Registry Number:** H-10879

Sheet Number: RA-10-08-99

Survey Title: Funter Bay

Data Acquisition Dates: **From:** 01-May-99 121 **To:** 06-Jun-99 157

Vessel Usage Summary

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

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
9		121	265	58/14/33	121-126
				134/56/30	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
SEA58	00 hr 00 min	X0.95
SEA57	00 hr 00 min	X0.93
57A	00 hr 00 min	X0.93

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-2321	FUNTER BAY	4/29/99	5/9/99
945-2294	HAWK INLET	4/29/99	6/9/99

Statistics Summary

Type	Total:
BS	9
DEV	5.67
DP	79
HOL	6.27
MBMS	14.34
MBXL	2.41
MS	72.71
S/L	12.22
SPLIT	45.88
SWMB	84.1
XL	14.26

Percent XL:	19.6%
SQNM:	10.9

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

ADVANCE INFORMATION

NOAA Ship RAINIER
August 15, 1999

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

Dear CDR Hamblett:

It is requested that the following danger to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned this feature while conducting hydrographic survey H10879 in Lynn Canal, southeast Alaska. The danger is shown graphically on the attached chartlet.

The following danger to navigation affects chart 17316, 18th edition, 1998, Funter Bay inset, 1:20,000. 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	3-1/2	58:14:29.62	134:54:21.72	73614	6.6

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-07-99. 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

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

Cc: NIMA
PMC
N/CS261
N/CS34

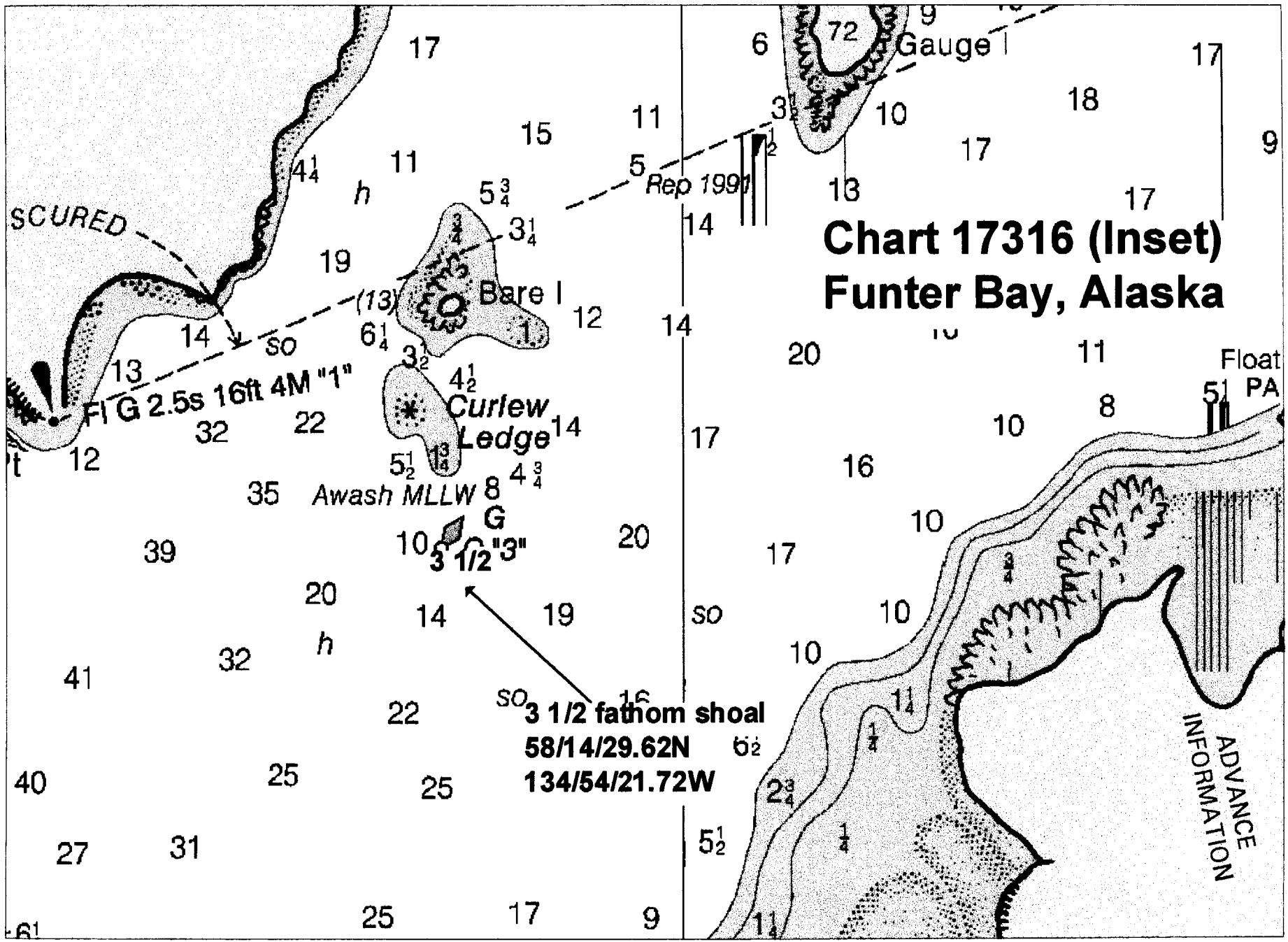


Chart 17316 (Inset)
Funter Bay, Alaska
SCURED
Fl G 2.5s 16ft 4M "1"
Bare I
Curlew Ledge
Awash MLLW
G
3 1/2"3"
3 1/2 fathom shoal
58/14/29.62N
134/54/21.72W
Rep 1991
Gauge
Float PA
ADVANCE INFORMATION

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

ADVANCE INFORMATION

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 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	-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

ADVANCE
INFORMATION

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

Alan D. Anderson
Captain, NOAA
Commanding Officer

Attachments

cc: NIMA
PMC
N/CS261
N/CS34

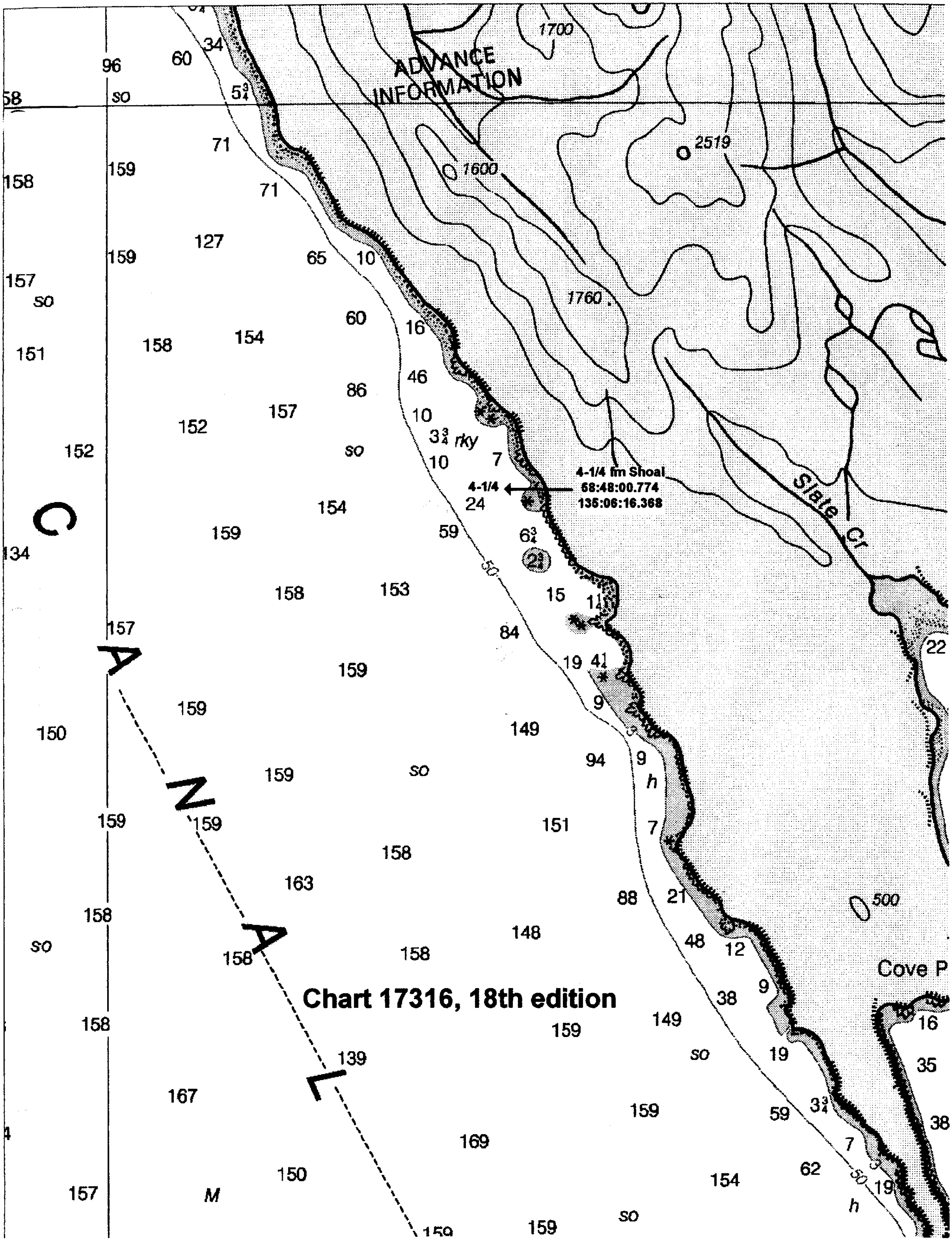
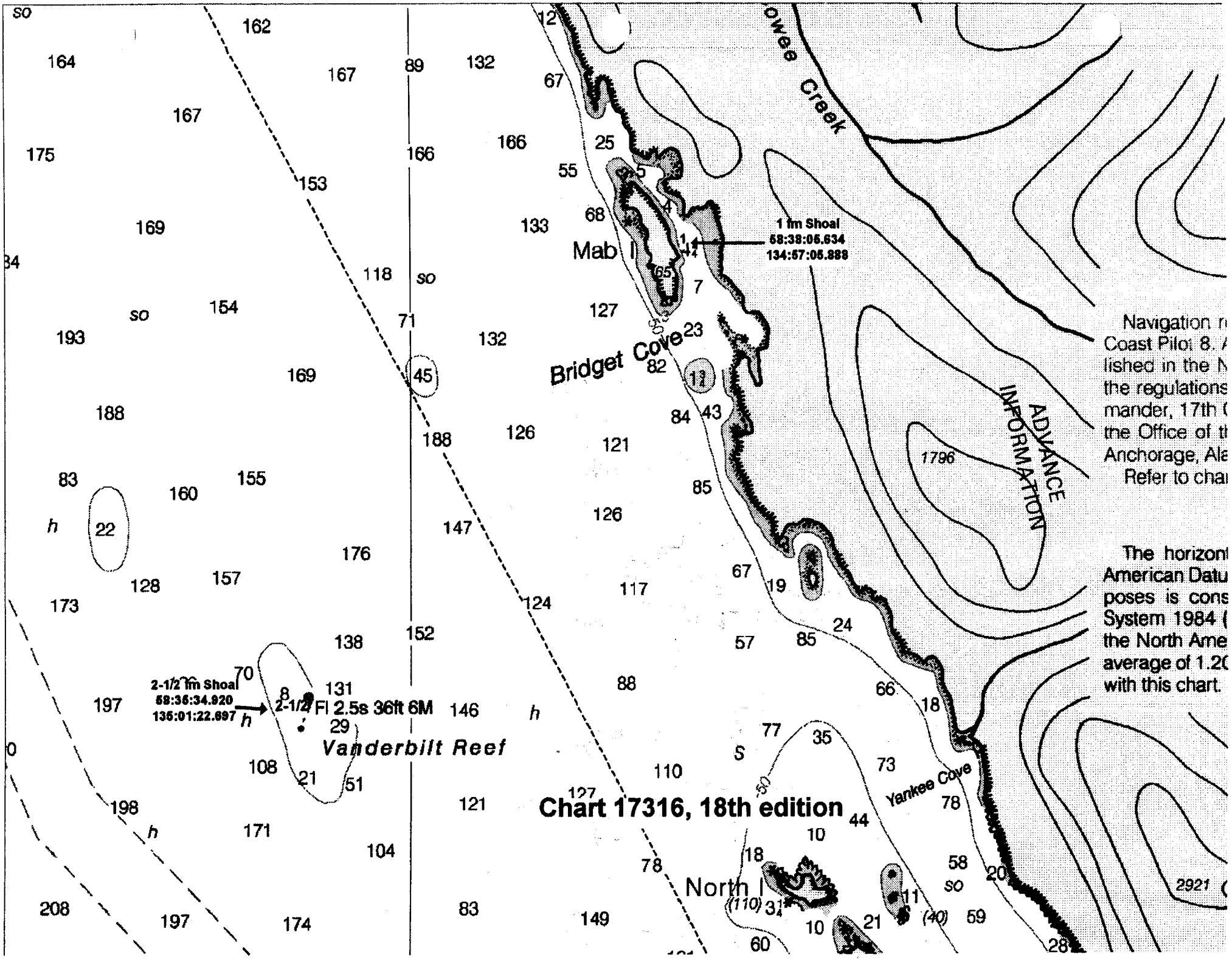
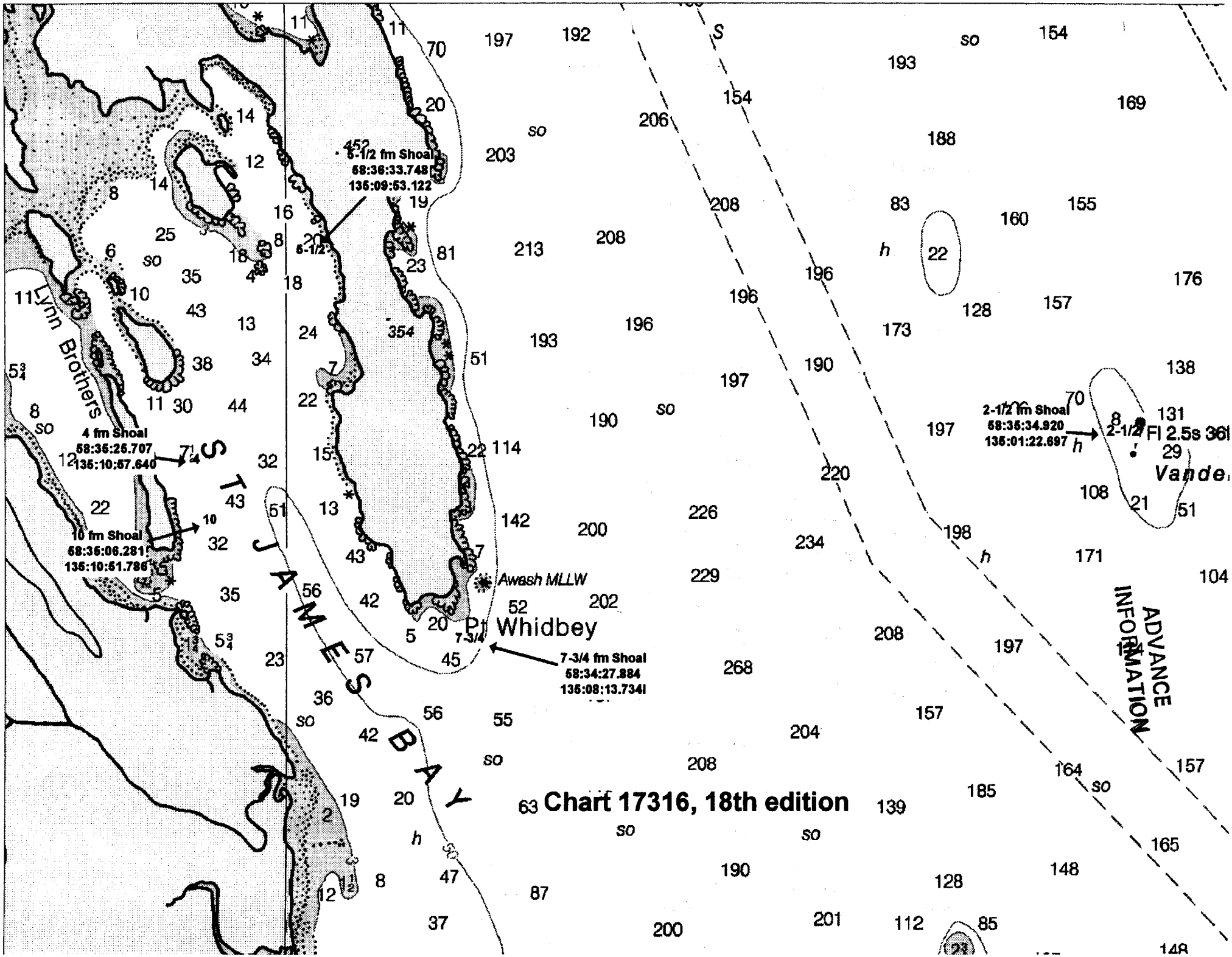
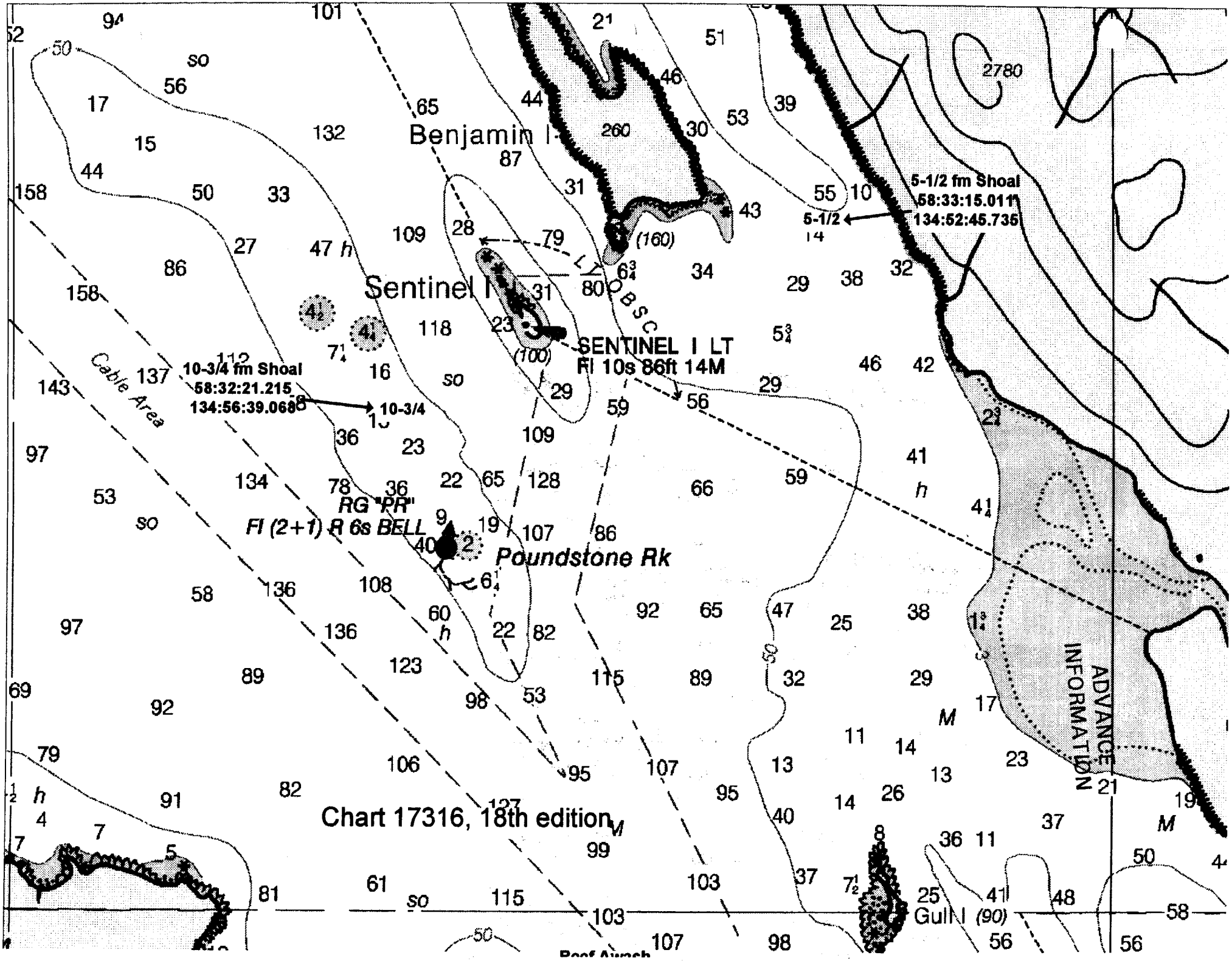
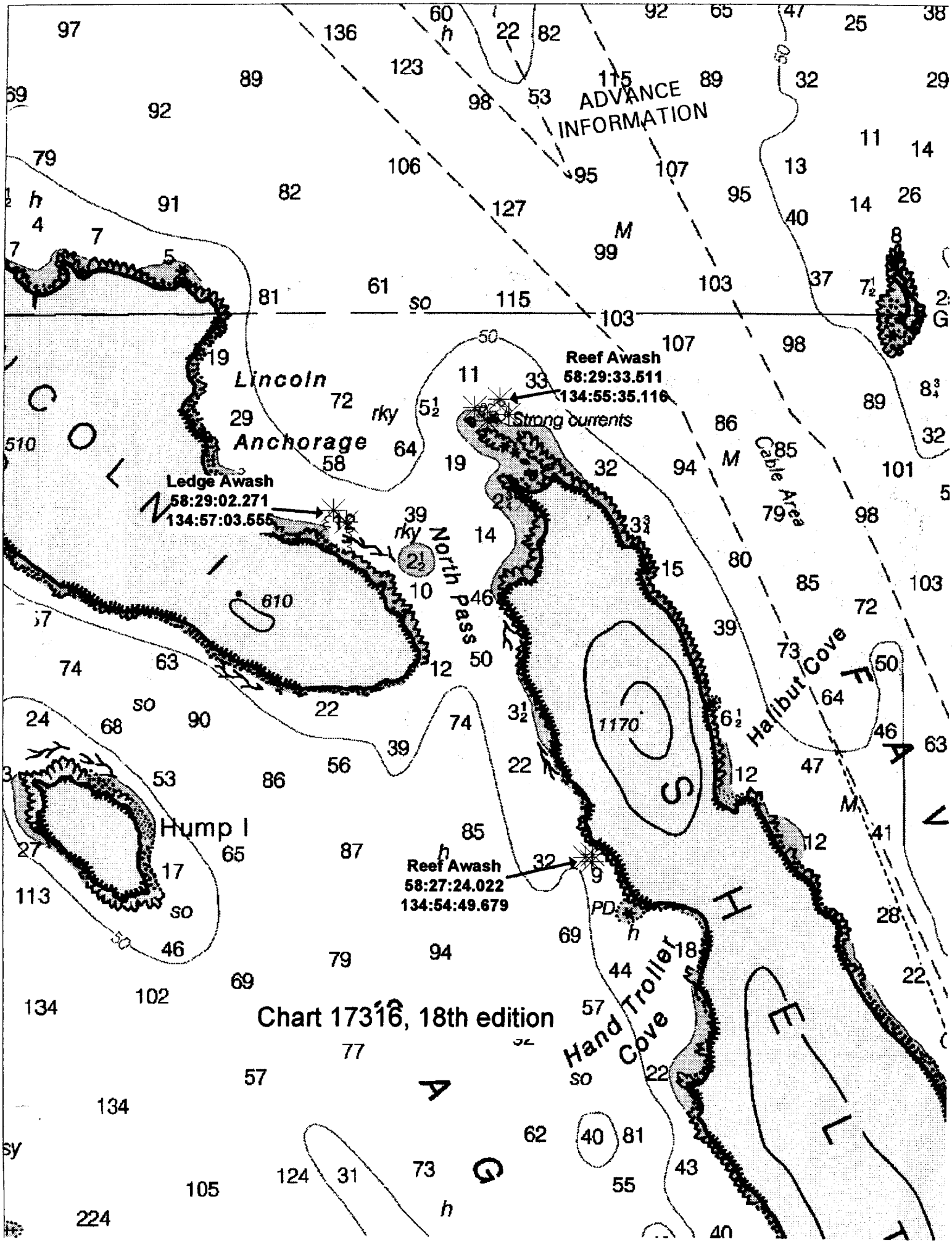


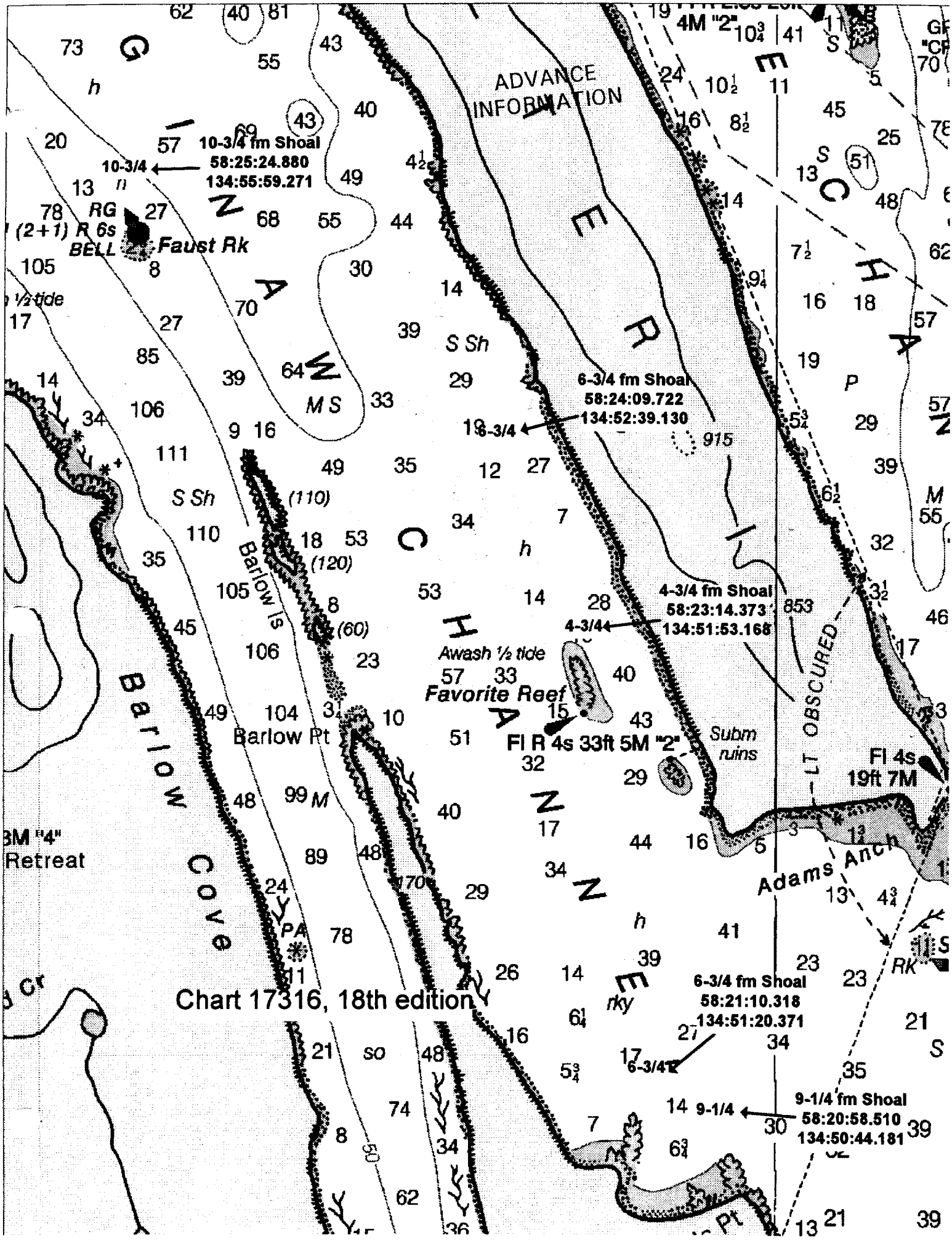
Chart 17316, 18th edition


Bridget Cove
Mab I
1 fm Shoal
58:38:06.634
134:57:05.888
2-1/2 fm Shoal
58:36:34.920
136:01:22.697
2-1/2 Fl 2.5s 36ft 6M
Vanderbilt Reef
Yankee Cove
North I
Chart 17316, 18th edition
ADVANCE INFORMATION
Navigation
Coast Pilot 8.
lished in the
the regulations
mander, 17th
the Office of
Anchorage, Ala
Refer to cha
The horizon
American Datu
poses is cons
System 1984
the North Ame
average of 1.2
with this chart.


5-1/2 fm Shoal
58:36:33.748
135:09:53.122
4 fm Shoal
58:35:25.707
135:10:57.640
10 fm Shoal
58:35:06.281
135:10:51.786
7-3/4 fm Shoal
58:34:27.884
135:08:13.734
2-1/2 fm Shoal
58:35:34.920
135:01:22.697
Awash MLLW
Pt Whidbey
Lynn Brothers
JAMES BAY
ADVANCE INFORMATION
Chart 17316, 18th edition


Benjamin I
Sentinel I
SENTINEL I LT
Fl 10s 86ft 14M
5-1/2 fm Shoal
58:33:15.011
134:52:45.735
5-1/2
10-3/4 fm Shoal
58:32:21.215
134:56:39.068
10-3/4
Cable Area
RG "PR"
Fl (2+1) R 6s BELL
Poundstone Rk
LT OBSC
ADVANCE INFORMATION
Gull I (90)
Chart 17316, 18th edition


ADVANCE INFORMATION
Lincoln
Anchorage
Reef Awash
58:29:33.511
134:55:35.116
Strong currents
Ledge Awash
58:29:02.271
134:57:03.555
North Pass
Cable Area
Halibut Cove
Hump I
Reef Awash
58:27:24.022
134:54:49.679
Hand Troller Cove
Chart 17316, 18th edition


ADVANCE INFORMATION
10-3/4 fm Shoal
58:25:24.880
134:55:59.271
10-3/4
Faust Rk
BELL
6-3/4 fm Shoal
58:24:09.722
134:52:39.130
6-3/4
4-3/4 fm Shoal
58:23:14.373
134:51:53.168
4-3/4
Favorite Reef
Awash ½ tide
Fl R 4s 33ft 5M "2"
Subm ruins
LT OBSCURED
Fl 4s
19ft 7M
Barlow Pt
Barlow Cove
Barlow Is
Adams Anch
6-3/4 fm Shoal
58:21:10.318
134:51:20.371
6-3/4
9-1/4 fm Shoal
58:20:58.510
134:50:44.181
9-1/4
Chart 17316, 18th edition

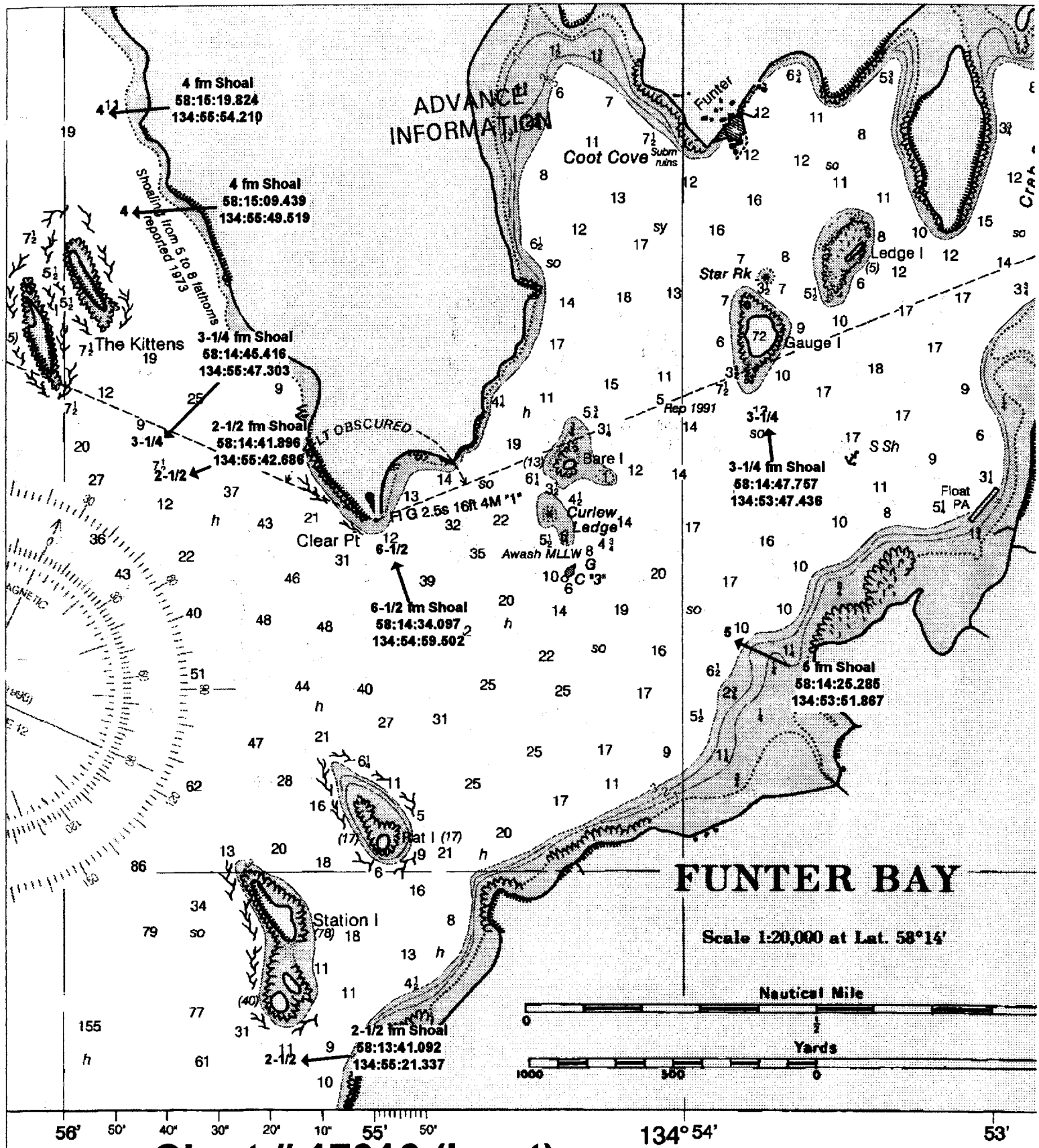


Chart # 17316 (inset)

77 14

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

ADVANCE INFORMATION

NOAA Ship RAINIER
August 15, 1999

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

Dear CDR Hamblett:

It is requested that the following danger to navigation be included in the Local Notice to Mariners. The NOAA Ship RAINIER positioned this feature while conducting hydrographic survey H10879 in Lynn Canal, southeast Alaska. The danger is shown graphically on the attached chartlet.

The following danger to navigation affects chart 17316, 18th edition, 1998, Funter Bay inset, 1:20,000. 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	3-1/2	58:14:29.62	134:54:21.72	73614	6.6

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-07-99. 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

Daniel R. Herlihy
Commander, NOAA
Commanding Officer

Attachment

Cc: NIMA
PMC
N/CS261
N/CS34

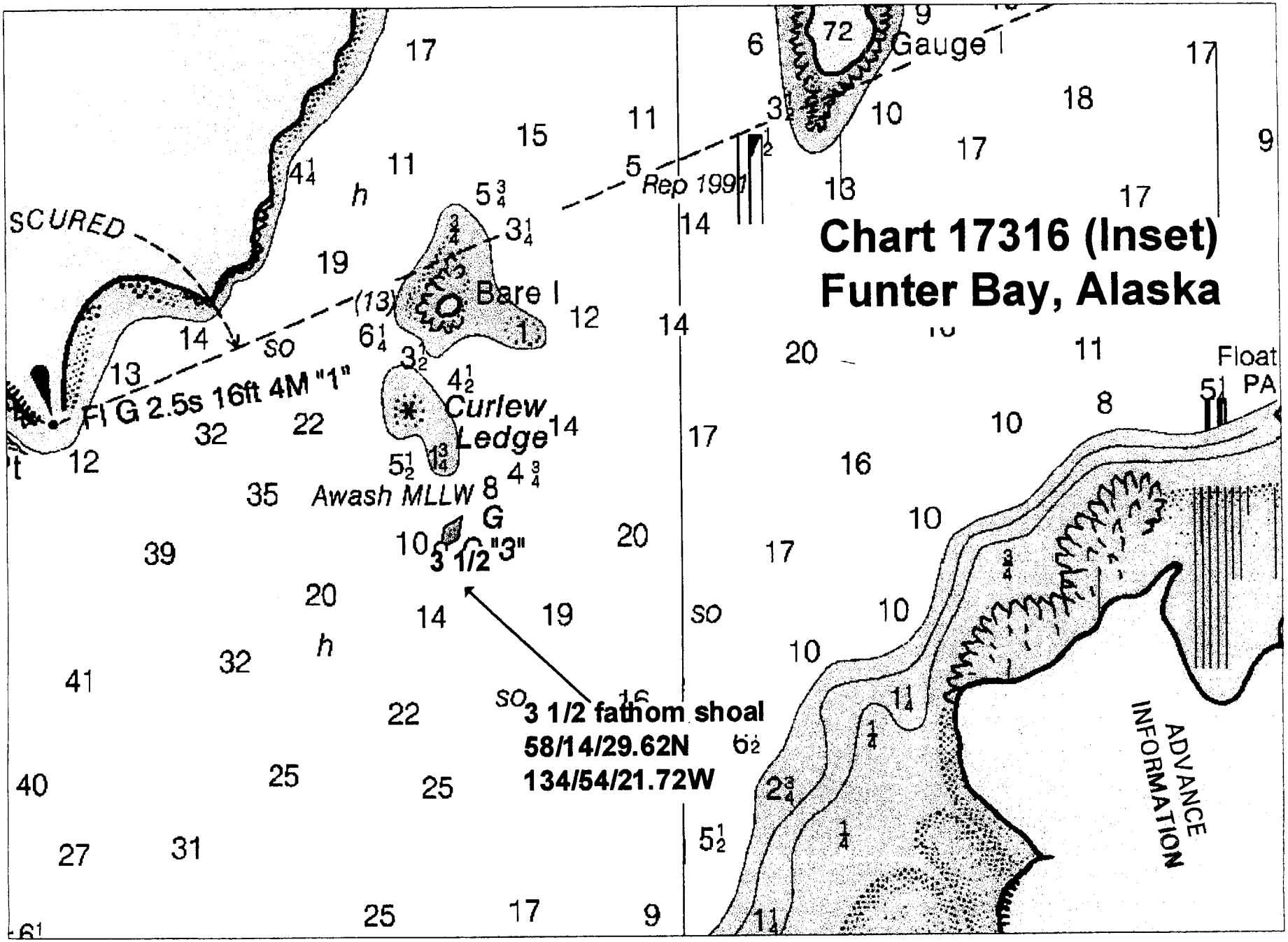


Chart 17316 (Inset)
Funter Bay, Alaska
Gauge I
Rep 1991
SCURED
Fl G 2.5s 16ft 4M "1"
Bare I
Curlew Ledge
Awash MLLW
G
"3"
3 1/2
3 1/2 fathom shoal
58/14/29.62N
134/54/21.72W
Float
PA
ADVANCE INFORMATION

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

October 13, 1999

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

Dear Sir:

During office review of hydrographic survey H-10879, Alaska, Lynn Canal, Funter Bay, two additional shoal depths and two features were found and are 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

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-10879

Survey Title: State: ALASKA
Locality: LYNN CANAL
Sublocality: FUNTER BAY

Project Number: OPR-O340-RA

Survey Date: MAY - JUNE 1999

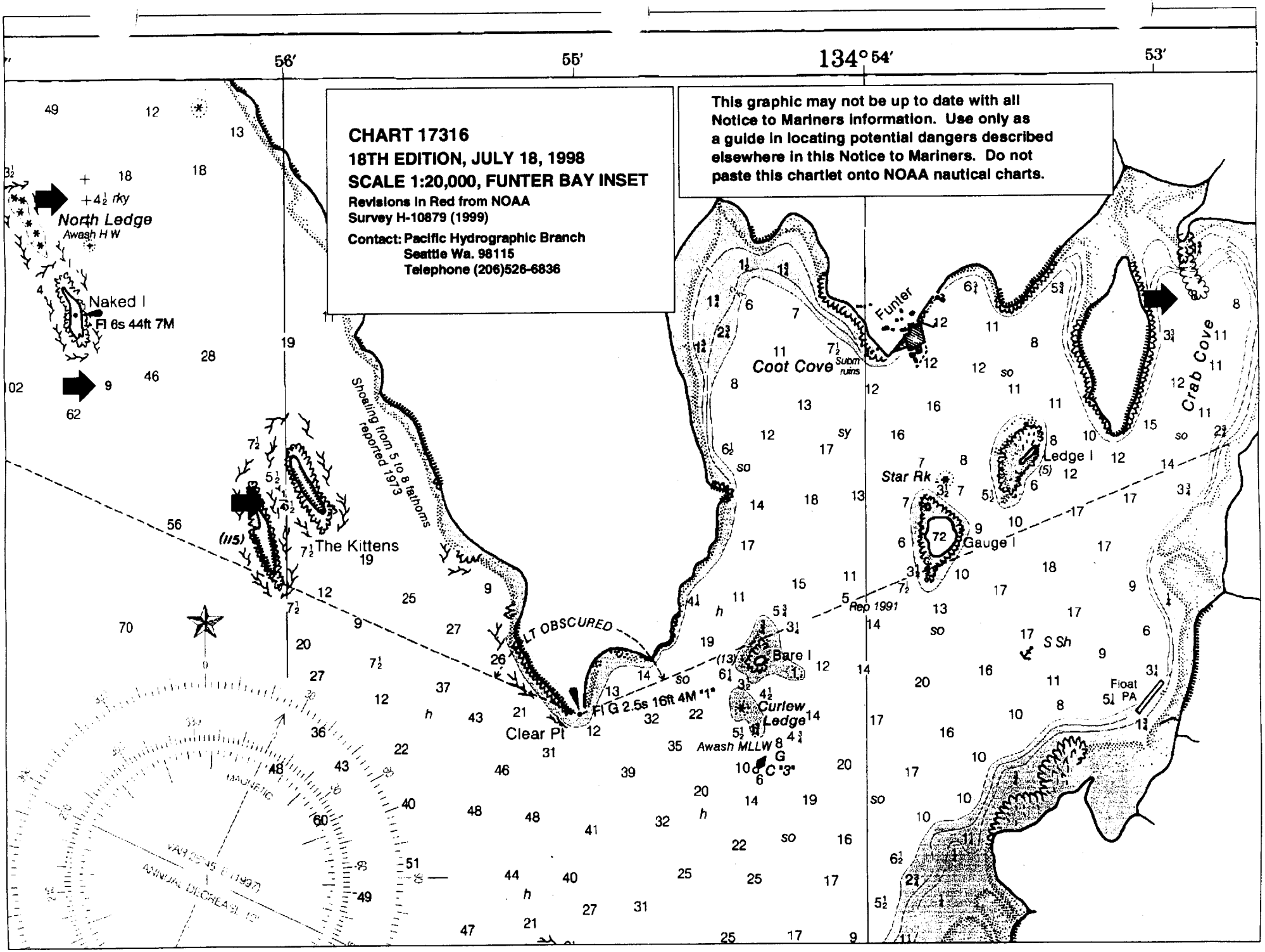
Soundings and features are reduced to Mean Lower Low Water using preliminary tides and are positioned on NAD 83.

Chart affected: 17316 18TH Edition July 18, 1998, scale 1:80,000/1:20,000 inset, NAD 83

DANGER TO NAVIGATION	LATITUDE(N)	LONGITUDE(W)
Ledge	58/15/20.5	134/52/50.16
0.4 fathom sounding	58/15/0.0	134/56/0.6
8.8 fathom sounding	58/15/12.6	134/56/36.6
*Reef covered between	58/15/34.56	134/56/41.28
and	58/15/29.52	134/56/41.03

*Portrayed on graphic as rocks

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


56'
55'
134° 54'
53'
CHART 17316
18TH EDITION, JULY 18, 1998
SCALE 1:20,000, FUNTER BAY INSET
Revisions in Red from NOAA
Survey H-10879 (1999)
Contact: Pacific Hydrographic Branch
Seattle Wa. 98115
Telephone (206)526-6836
This graphic may not be up to date with all Notice to Mariners information. Use only as a guide in locating potential dangers described elsewhere in this Notice to Mariners. Do not paste this chartlet onto NOAA nautical charts.
North Ledge
Awash H W
Naked I
Fl 6s 44ft 7M
The Kittens
Shoaling from 5 to 8 fathoms reported 1973
LT OBSCURED
Fl G 2.5s 16ft 4M "1"
Clear Pt
Coot Cove
Subm ruins
Funter
Crab Cove
Ledge I
Star Rk
Gauge I
Rep 1991
S Sh
Bare I
Curlew Ledge
Awash MLLW
G "3"
Float PA
MAGNETIC
VAR 22° 45' E (1997)
ANNUAL DECREASE 15'

APPROVAL SHEET

for

H10879

RA-10-08-99

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-10879

LOCALITY: Funter Bay, Lynn Canal, AK
TIME PERIOD: May 1 - June 6, 1999

TIDE STATION USED: 945-2321 Funter Bay, Mansfield Peninsula, AK
Lat. 58° 15.3'N Lon. 134° 53.8'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.399 meters

TIDE STATION USED: 945-2294 Hawk Inlet Entrance, AK
Lat. 58° 05.2'N Lon. 134° 46.6'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.393 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA61.

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-10879 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.

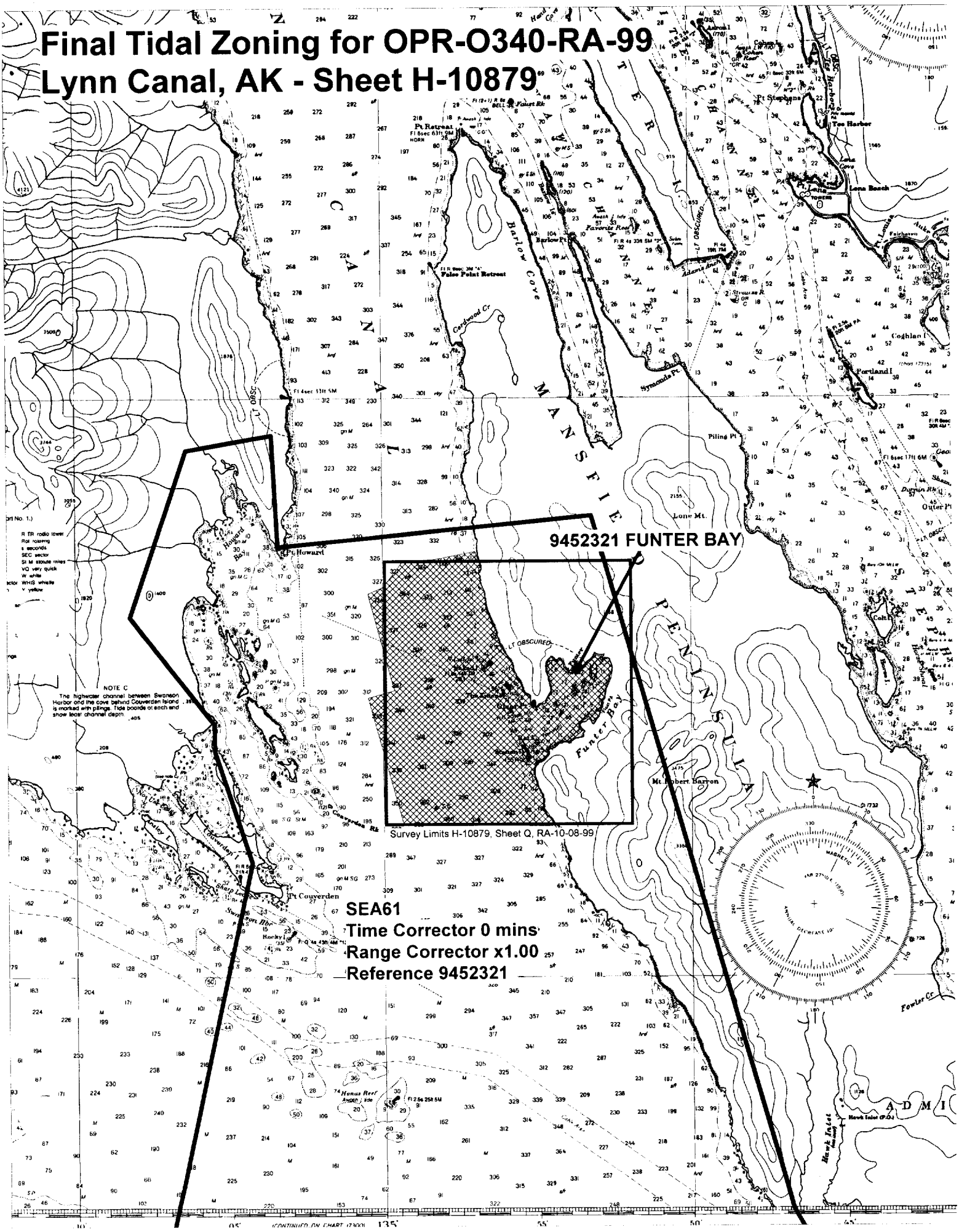
for CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-O340-RA-99,
Sheet H-10879.

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 SEA61			
-134.959218 58.041117	9452321	0	1.00
-135.14771 58.054253	9452294	0	1.00
-135.118932 58.083961			
-135.071513 58.199522			
-135.091253 58.231806			
-135.091462 58.239746			
-135.136994 58.270642			
-135.106151 58.318618			
-135.059847 58.322891			
-135.056682 58.290764			
-134.886639 58.299621			
-134.779935 58.099384			
-134.759117 58.079735			
-134.761492 58.034383			
-134.805447 58.055403			
-134.959218 58.041117			

Final Tidal Zoning for OPR-O340-RA-99
Lynn Canal, AK - Sheet H-10879



NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10879

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	
ADMIRALTY ISLAND	X		X							1
ALASKA (TITLE)	X		X							2
BARE ISLAND	X		X							3
CLEAR POINT	X		X							4
COOT COVE	X		X							5
CRAB COVE	X		X							6
CURLEW LEDGE	X									7
FUNTER (ppl)	X		X							8
FUNTER BAY	X		X							9
GAUGE ISLAND	X		X							10
LEDGE ISLAND	X		X							11
LYNN CANAL	X		X							12
MANSFIELD PENINSULA	X		X							13
NAKED ISLAND	X		X							14
NORTH LEDGE	X		X							15
RAT ISLAND	X		X							16
STAR ROCK	X		X							17
STATION ISLAND	X		X							18
THE KITTENS	X		X							19
										20
										21
										22
										23
										24
										25

Dennis J. Rensberger

OCT 25 1999

NOAA FORM 77-27(H)
(9-83)

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER
H-10879

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET		SMOOTH OVERLAYS: POS., ARC, EXCESS	NA
DESCRIPTIVE REPORT		FIELD SHEETS AND OTHER OVERLAYS	NA

DESCRIPTION	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 and GC 10426
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	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	55		55
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	147		147
COMPARISON WITH PRIOR SURVEYS AND CHARTS		25	25
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		22	22
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		69	69
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	202	116	318

Pre-processing Examination by R. Davies	*Beginning Date* 10/1/99	*Ending Date* 11/1/99
Verification of Field Data by R.Davies,D.Doles,R.Mayor,G.Nelson,E.Domingo,L.Deodato	*Time (Hours)* 202	*Ending Date* 5/12/99
Verification Check by D. Hill	*Time (Hours)*	*Ending Date* 6/23/00
Evaluation and Analysis by L. Deodato	*Time (Hours)* 47	*Ending Date* 5/16/00
Inspection by D. Hill	*Time (Hours)* 7	*Ending Date* 6/23/00

EVALUATION REPORT
H10879

A. PROJECT

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

B. AREA SURVEYED

With the exception of the following the survey area is adequately described in the hydrographer's report.

The bottom consists mainly of sand, pebbles and broken shell. Depths range from -1.1 to 393 fathoms. A page-size plot of the charted area depicting the limits of supersession accompany this report as Attachment 1.

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 discussed 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 and MicroStation 95.

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 the Specifications and Deliverables, April 1999.

The data are plotted on NAD 83 using a Universal Transverse Mercator, Zone 08 projection and are depicted on a single sheet. 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:	-1.211 seconds (-37.480 meters)
Longitude:	6.470 seconds (105.540 meters)

E. SONAR EQUIPMENT

Side scan sonar was not used during the survey.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed 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 verified tide correctors obtained from CO-OPS. The correctors are zoned direct from station 945-2321, Funter Bay, Mansfield Peninsula, Alaska. Hawk Inlet Entrance, Alaska, gage 945-2294, listed in the approved tide note was not used.

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 specifications.

H. CONTROL STATIONS

Horizontal control is adequately discussed in the hydrographer's report

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 4.0 was specified in the project instructions. Three hundred forty two (342) positions exceed this limit and were rejected by the hydrographer.

During data collection satellite configuration, as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. During multibeam operations 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 contained no significant errors.

Additional information concerning 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

Shoreline maps GC10425 and GC10426 were compiled on NAD83 and apply to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital data as provided by the Remote Sensing Division, NGS. The shoreline data and the hydrographic data were merged during MicroStation processing. The rock at latitude 58°15'20.83"N, longitude 134°52'44.05"W, originating with the above remote sensing data was not investigated by the hydrographer and is shown on the smooth sheet. There were no MHW revisions on this survey.

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 H10879 junctions with the following surveys:

Survey	Year	Scale	Area
H10881	1999	1:20,000	North and West
H10882	1999	1:20,000	South

The junctions with surveys H10881 and H10882 are complete. A "Joins" note has been added to the smooth sheet where applicable. A few soundings from the junctional surveys have been transferred within the common areas of H10879 to better delineate the bottom configuration.

M. COMPARISON WITH PRIOR SURVEYS

The present survey was compared to the following prior surveys.

Survey	Year	Scale	Datum
H02055	1890	1:80,000	Unknown
H02062	1890	1:10,000	Unknown

Prior surveys H02055 and H02062 cover the entire area of the present survey. The present survey was compared to the digital raster copies of H02055 and H02062. The prior surveys plots do not contain latitude-longitude grid lines. Therefore, registration to the present survey smooth sheet was accomplished through alignment of similar geographic features. The legibility of H02055 is marginal and in some areas unreadable. Accordingly, a comparison was made between the present survey and chart 17316. Assuming that all critical depths and clearances would have been previously transferred from the prior surveys to the chart it functioned as a proxy for

the prior surveys for the purpose of supersession analysis. The legibility of the survey H02062 smooth sheet is acceptable and comparison was made directly between it and the present survey.

Sounding agreement is good with the present survey depths shoaler by 0 to 16 fathoms with H2055 and 1 to 2 fathoms with H2062. These differences may be attributed to greater sounding coverage, improved positioning and sounding methods and relative accuracy of the data acquisition techniques.

Survey H10879 is adequate to supersede the above prior surveys within the common area.

Survey	Year	Scale	Datum
H04228WD	1922	1:40,000	Unknown

The present survey was compared to the digital copy of the above prior wire drag survey. The registration of this prior survey to the present survey is good however, the legibility of the digital image is marginal. Accordingly, a similar comparison between the present survey and the chart as discussed above was accomplished.

The above wire-drag survey only covers an area of 0.5 to 1 mile wide along the coast of the present survey. Depths in this area are Those areas greater than 20 meters were adequately developed by echosounder. Depths less than 20 meters were adequately developed by multibeam echosounder. All areas of wiredrag coverage are considered to be adequately developed and therefore the wiredrag survey is considered to be superseded. Chart 17316 should be revised to eliminate the tint common to the area of the present survey.

N. ITEM INVESTIGATIONS

There were five AWOIS items assigned to this survey. They were adequately addressed in section M of the hydrographer's report.

O. COMPARISON WITH CHART

Survey H10879 was compared with the following charts:

Chart	Edition	Date	Scale
17316	18th	July 18, 1998	1:80,000
17316 (inset)	18th	July 18, 1998	1:20,000

a. Hydrography

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

Charted information originating with miscellaneous source data has been satisfactorily addressed during survey operations.

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.

The charted anchorage symbol at latitude 58°14'41"N, longitude 134°53'30"W should be retained as charted.

The pier charted on the inset centered at latitude 58°15'17"N, longitude 134°53'11"W was not verified by the hydrographer. The evaluator consulted the hydrographer, Ensign Angie J. Venturato regarding this pier and determined from her that the only pier in the area is the floating pier shown on the smooth sheet. Because the existence of submerged ruins is unknown but possible the charted pier should be revised to submerged pier ruins.

With the exception noted above, survey H10879 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

Nine dangers to navigation were discovered during survey operations and reported to the USCG on JUNE 13, 1998(year incorrect) and August 15, 1999. Five additional dangers to navigation were found during office processing. These were reported to the USCG, NIMA and N/CS1 on October 13, 1999. Copies of the/these reports are attached.

P. ADEQUACY OF SURVEY

With the exception of the items mentioned below, hydrography contained on survey H10879 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 used of an unauthorized source of shoreline information prevented the hydrographer from disproving the existence of, or reclassifying the symbolization of rocks originating with photogrammetric sources.

The ruins of the charted pier on the chart inset centered at latitude 58°15'17"N, longitude 134°53'11"W as stated in section O of this report.

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 Field Procedures Manual, April 1994 Edition, and the NOS Hydrographic Surveys Specifications and Deliverables, dated April 23, 1999.

Q. AIDS TO NAVIGATION

Two fixed aids and one floating aid to navigation exist within the survey area. They were located and determined to adequately mark the intended features.

Aid to Navigation	Latitude N	Longitude W	Light List No.
Naked Island Light	58°15'20.45"	134°56'43.80"	23970
Funter Bay Entrance Light 1	58°14'36.83"	134°54'59.54"	23975
Funter Bay Buoy C"3"	58°14'31.39"	134°56'17.08"	23980

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

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

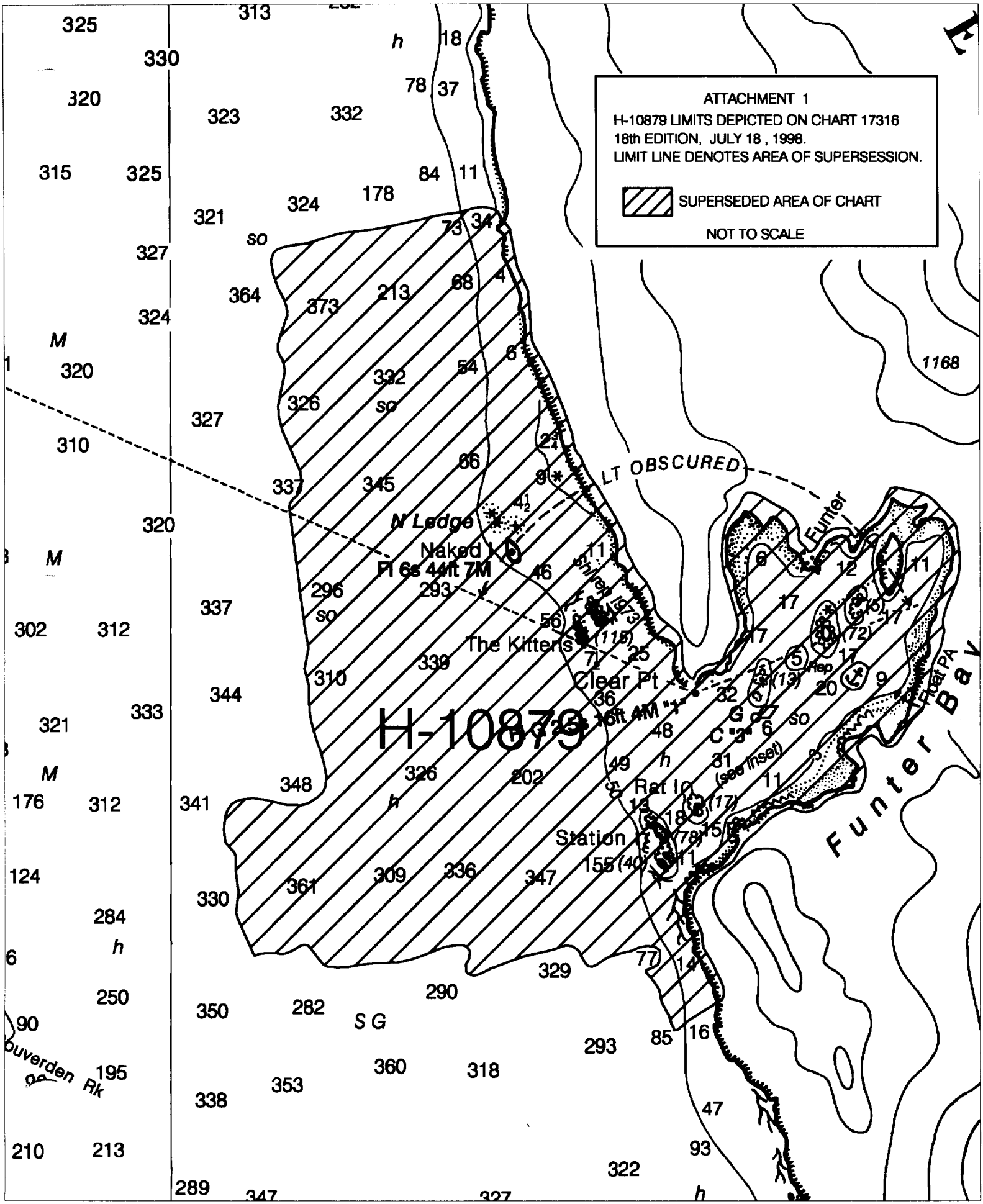
T. RECOMMENDATIONS

This 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.

Leonardo T. Deodato
Cartographer


ATTACHMENT 1
H-10879 LIMITS DEPICTED ON CHART 17316
18th EDITION, JULY 18 , 1998.
LIMIT LINE DENOTES AREA OF SUPERSESSION.
SUPERSEDED AREA OF CHART
NOT TO SCALE
H-10879
LT OBSCURED
N Ledge
Naked I
Fl 6s 44ft 7M
The Kittens
Clear Pt
16ft 4M "1"
Rat Is
Station I
Funter
Funter Bay
Float PA
Buverden Rk

APPROVAL SHEET
H10879

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.

Date: 6-23-00

Dennis Hill
Chief, Cartographic Team
Pacific Hydrographic Branch

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.

Date: 7-6-00

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

****

Final Approval

Approved:

Date: July 28, 2000

Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10879

INSTRUCTIONS

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
17316	5/18/00	Leo T. Dervato	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via
			Drawing No. Application of soundings and features from smooth sheet,
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED