

H10862

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-10-03-99
Registry No. H-10862

LOCALITY

State Alaska
General Locality . Lynn Canal
Sublocality North Island to Vicinity
of Point Bridget

1999

CHIEF OF PARTY
CAPT A.D. Anderson

LIBRARY & ARCHIVES

DATE MAY 8 2000

HYDROGRAPHIC TITLE SHEET

H-10862

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-10-03-99

State Alaska

General locality Lynn Canal

Locality North Island to Vicinity of Bridget Point

Scale 1:10,000 Date of survey April 8, 1999 - June 7, 1999

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

Vessel NOAA Ship 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 8101SWMB
Seabeam 1050D LE, Pneumatic Depth Gage

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: B. Olmstead Automated plot by HP Design Jet 650
~~XXXXXXXXXX~~

Verification by E. Domingo, R. Mayor, B. Olmstead

Soundings in fathoms ~~xxx~~ at MLLW ~~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
interrupted or non-sequential. All depths listed in this report
are referenced to mean lower low water unless otherwise noted.

* Change 1 dated March 30, 1998

* Change 2 dated April 12, 1999

* Change 3 dated May 6, 1999

Amis / suif 4/4/00 mcr

PROGRESS SKETCH

May, 1999

OPR-0340-RA-99
Lynn Canal, Alaska

Capt. A. D. Anderson
COMMANDING

Chart 17300

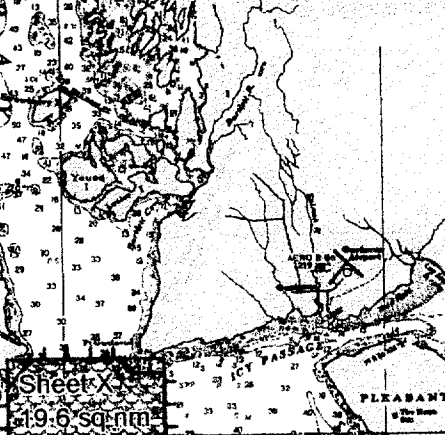
APRIL

MAY

JUNE

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

NOTE: This sketch is a progress sketch and does not represent the final boundary of the National Marine Sanctuaries. The final boundary of the National Marine Sanctuaries will be determined by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of the Interior (DOI) in cooperation with the State of Alaska and the U.S. Department of the Interior (DOI). These final boundaries are subject to modification, as approved by the Secretary of the Interior and the Secretary of the Department of the Interior.

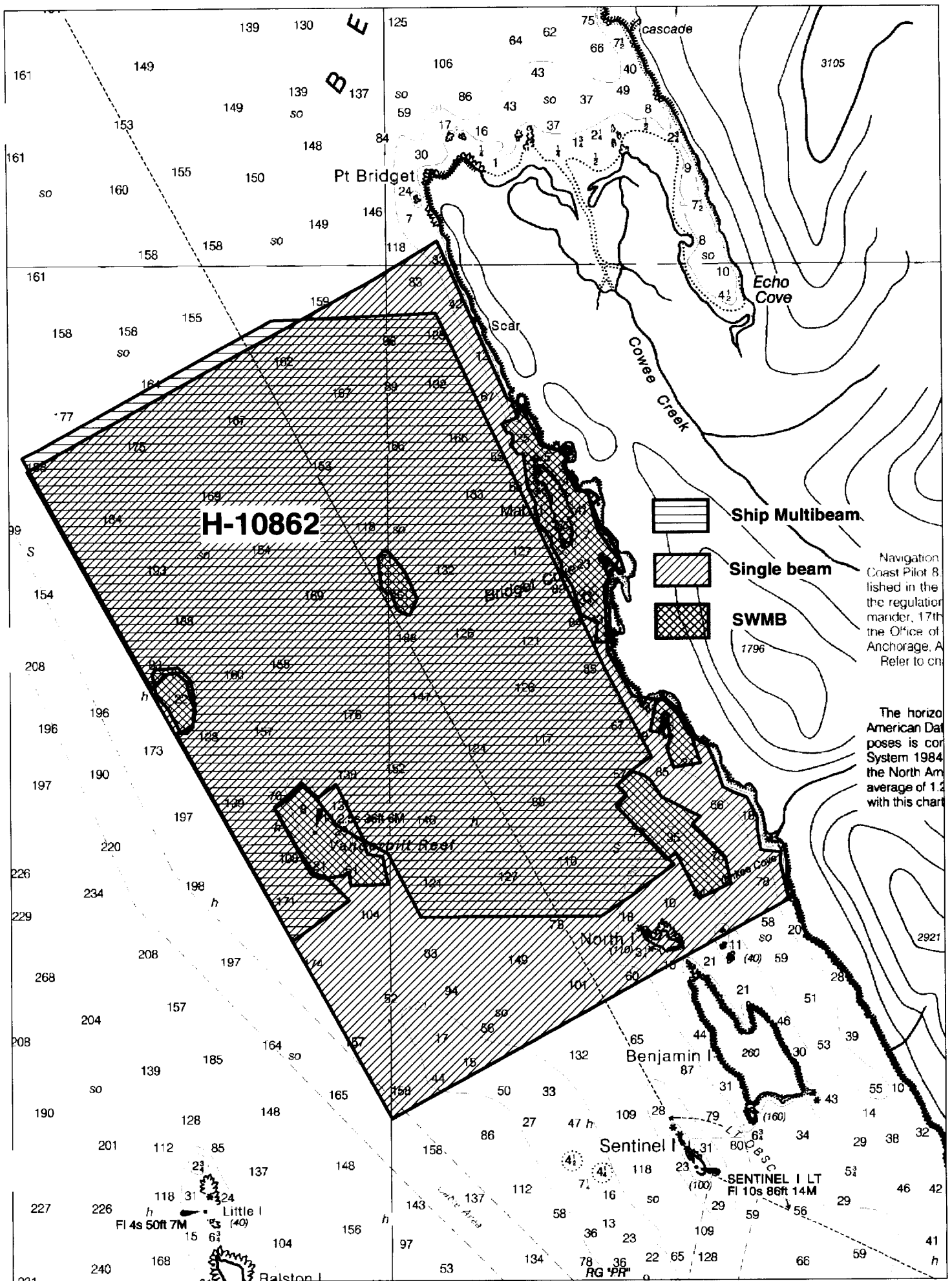


Accomplished	April	May	June
LNM Hydro	2910	679	
LNM SSS	0	0	
SQ NM	43.89	144.17	
AWOIS Invest.	0	9	
Other Invest.	0	4	
LNM Multibeam	174.4	1053.64	
Days at Sea	28	26	

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	87			21.2
N	H-10865	4/14	92			16.7
P	H-10870	4/20	90			11.1
Q	H-10879	5/1	50			5.5
R	H-10869	4/18	98	6/2		14.4
T	H-10864	4/13	100	5/25		47.8
U	H-10880	5/3	98	6/2		27.5
V	H-10881	5/2	15			3.5
W	H-10882	5/6	10			5.3
Y	F00451	5/20	100	5/20		0.16
X	H-10883	5/10	100	5/20		19.6

CAUTION: Shading areas are in 1:25,000 scale. The shaded areas are not to be used for navigation purposes. It is a precaution that the Alaska Department of Fish and Game, 1999, is not responsible for any damage or loss of life or property resulting from the use of this chart.

NOTE: This sketch is a progress sketch and does not represent the final boundary of the National Marine Sanctuaries. The final boundary of the National Marine Sanctuaries will be determined by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Department of the Interior (DOI) in cooperation with the State of Alaska and the U.S. Department of the Interior (DOI). These final boundaries are subject to modification, as approved by the Secretary of the Interior and the Secretary of the Department of the Interior.



Descriptive Report to Accompany Hydrographic Survey H-10862

Field Number RA-10-03-99

Scale 1:10,000

April – June, 1999

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

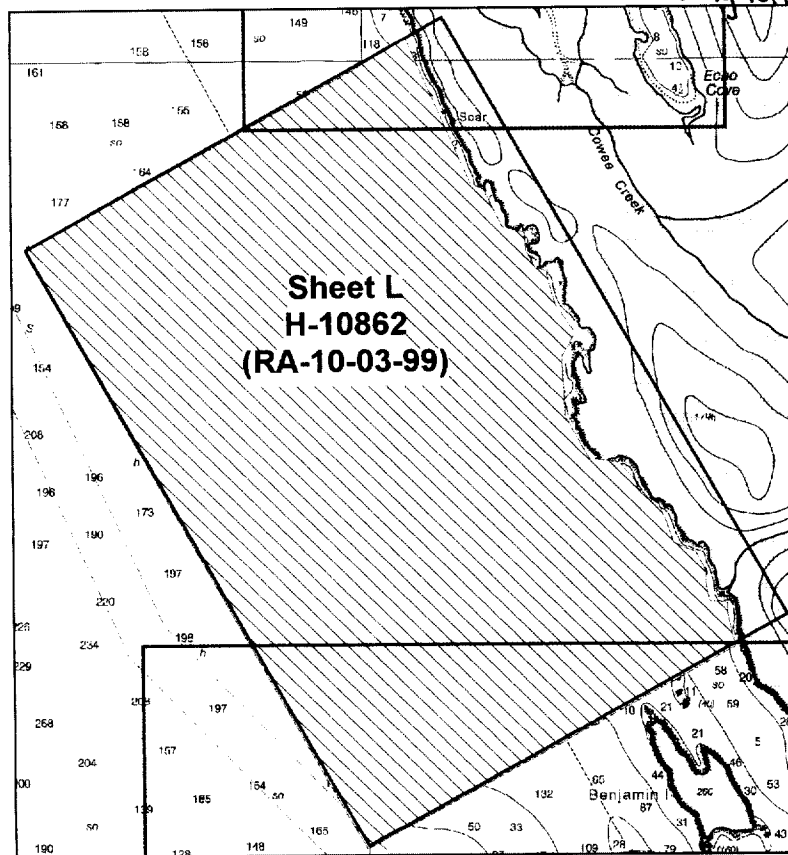
A. PROJECT ✓

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 H-10862 corresponds to **sheet L** 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 Lynn Canal, from ^{North Island to vicinity of} Vanderbilt Reef to Pt. Bridget (H-10862). Survey limits are shown below on a detail of Chart 17316 (Illustration 1) (Northern limit $58^{\circ}40'15''N$, Southern limit $58^{\circ}33'15''N$, Western limit $135^{\circ}05'30''W$ and the Eastern limit is the shoreline). Water traffic was seen regularly within Lynn Canal, primarily west of Vanderbilt Reef. The Alaska Ferries and smaller marine vessels (e.g., pleasure boats, fishing vessels) were seen occasionally within the survey limits during the data acquisition period. A variety of plane types were observed flying over the vicinity as well. On May 4, 1999, vessels 2123 and 2126 assisted the U.S. Coast Guard in searching for a downed plane in the vicinity of Bridget Cove. Anchorage sites for the RAINIER while surveying this area were by Benjamin Island or in Berner's Bay. Data acquisition was conducted from April 8 to June 7, 1999 (DN 098 to DN 158). * Most of the Survey data falls along latitude $58^{\circ}34'45''N$.

Illustration 1.



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. *Concur*

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All singlebeam data (VBES) were acquired using HYPACK version 8.9 and preliminary processing was accomplished with HPS and MapInfo. Final Detached Positions, Features, and Soundings based on preliminary tides zoned according to the Project Instructions, were saved in MapInfo 5.0 format. Shallow water multibeam (SWMB) echosounder data were acquired using the Triton Elics Reson SeaBat 8101 with ISIS version 4.32 and processed using CARIS software. Swath data collected by the RAINIER were acquired using the SeaBeam 1050D MKII and HydroStar ONLINE programs with ISIS version 4.32 and processed using CARIS software. The SWMB and SeaBeam data were converted from CARIS to HPS and preliminary process was accomplished with MapInfo. Raster image and shoreline data in MapInfo facilitated charted and prior survey comparisons. Final Detached Positions and soundings based on predicted tides were saved in MapInfo 5.0 format. A complete listing of software for HYPACK and HPS 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 SeaBat 8101 provides a 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. *Concur*

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 VBES sounding instruments 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 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace. Serial numbers are included in the Separates. * VBES launches were used to collect mainscheme hydrography in areas that were considered too hazardous or too shallow for shipboard ELAC SeaBeam 1050D MKII coverage, generally areas less than 100 meters of depth. In addition, singlebeam launches were used to perform all shoreline verification. *Concur*

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

Prior to beginning SWMB data acquisition, the launch CARIS Vessel Configuration Files were updated to define the physical relationship between the various components that comprise the systems, including the transducer head, TSS motion sensor and POS/MV positioning system. In addition, these offset files contain heave, roll and pitch biases determined during a "patch test" conducted at Port Angeles, WA on March 26-28, 1999. A copy of the Vessel Configuration Files are contained in Project Related Data for OPR-O340-RA.

The Reson SeaBat 8101 is a multibeam echosounder system that measures relative water depths across a wide swath perpendicular to the vessel's path. The Reson SeaBat 8101 ensonifies the seafloor with a 150° swath consisting of 101 individual 1.5° x 1.5° beams. The system was designed to meet International Hydrographic Organization standards to measure the seafloor at a maximum range of 320 meters. The system's maximum depth range for useable swath under actual field conditions is approximately 80-150 (45-82 fms) meters, depending on sea conditions and bottom topography. This winter, VN 2126 was installed with an

* Filed with the hydrographic records

extended range projector, amplifying the maximum depth capabilities to greater than 250 meters under good conditions as well as improving the quality of data in the shallower ranges. Serial numbers are included in the Separates. SWMB launches were used to collect full-bottom coverage of select areas identified during singlebeam hydrography if there was little risk of damaging the SWMB transducer. Due to the potential risk, the SWMB launches were not used for shoreline verification. *Concur*

The SeaBat depth data are displayed during acquisition and reviewed with CARIS-HIPS Data Cleaning programs. Depth flyers, as well as vessel positioning and attitude data, were displayed and manually cleaned. Additionally, instantaneous speed as computed from the positioning data was checked for jumps. For this survey, the outer ten beams on each side of the swath (beam numbers 1-10 and 92-101) were not used, reducing the effective swath width to 120°.

3. ELAC SeaBeam 1050D MKII ✓

The SeaBeam 1050D MKII is a hull-mounted, dual frequency, high-resolution multibeam echosounder system for shallow and medium water depths. The high frequency array (180 kHz) is used to acquire soundings ranging from 1 meter to 400 meters, while the effective range of the low frequency array (50 kHz) is from 10 meters to 3000 meters. The SeaBeam ensonifies the seafloor with a swath that ranges from 180° to 153°, depending on depth, using 42 beams in three fans for up to 128 beam-depths of 1½° x 2¾° along track.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Thirteen sound velocity casts were used for this survey, four for VBES data, six for SeaBeam, and three for SeaBeam data. One cast was used for both SWMB and SeaBeam data. Information on the casts is included in the Survey Information Summary report, and SVCasts.WOR. in MapInfo. *Survey Information Summary is attached to this report.*

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated November 13, 1998 and (S/N 2543), calibrated November 13, 1998 and (S/N 2477), calibrated November 13, 1998. Velocity correctors were computed using the PC program VELOCITY, version 4.0, 1998, in accordance with Hydrographic Survey Guideline (HSG) No. 69. For singlebeam launches, sound velocity correctors were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches and RAINIER SeaBeam soundings, sound velocity correctors were applied in Caris during post-acquisition processing. *Concur*

Vessel Offset Correctors ✓

The following table (Table 1) shows when the vessel offset correctors used for this survey were last measured:

Table 1.

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 were computed in accordance with Hydrographic Manual Section 4.9.4.2, using FPM Fig. 2.4, and are included with project data for OPR-O340-RA-99. All offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables # 1-6 corresponds to the last digit of the vessel number, with RAINIER being designated RA00 for multibeam data processing and #08 for HPS processing. For VBES launches, offset tables were applied to the raw sounding data in HPS during post-acquisition processing. For SWMB launches and RAINIER, offsets were applied during Caris processing. *Concur*
The offset tables are included with project data for OPR-O340-RA-99.

Preliminary Tidal Correctors: ✓

The Oceanographic Products and Services Division, User Services Branch (N/CS41), did not supply predicted tides for this project (OPR-O340-RA-99). Using Tides & Currents v2.5, preliminary predicted tide tables based on William Henry Bay that uses Juneau as a reference station, were generated for both HPS and CARIS. This 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 sequence.

After completion of data acquisition and all sounding data compiled into HPS, OPSD preliminary 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.3.41. Due to the incorrect zone phases and range values in the OPSD supplied tidal table, the values were re-entered in the field before application. Tide zone correctors were then computed and applied to all soundings in HPS (SeaBeam, SWMB, & VBES) to produce a final product.

Tidal correctors as provided in the project instructions for H-10862 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 two Sutron 8200 tide gages for this survey. One was at Cove Point (945-2346), installed on April 4th, 1999, removed on June 2nd, 1999; and one at Barlow Cove (945-2318), installed on April 4th, 1999, removed on June 7th, 1999. Refer to the Field Tide Notes and supporting data in Appendix V for individual gage performance and level closure information. This information has been forwarded to N/CS41 in accordance with HSG 50 and FPM 4.8. A request for approved tides was forwarded to N/CS41 in accordance with FPM 4.8. *Approved Tide Note dated October 19, 1999 is attached. Tide Note dated October 6, 1999 has been superseded.*

H. HYDROGRAPHIC POSITION CONTROL

The horizontal datum for this project is NAD 83. The control stations used for this survey are listed in Appendix III. *** See the OPR-O340-RA-99 Horizontal Control Report for more information. ** Copy is attached to this report.*

All soundings were positioned using differential GPS. Primary control was the VHF differential reference station at JOE. The US Coast Guard Beacon at GUSTAVUS and a VHF differential reference station at CURTIS were used as backup. Launch-to-launch DGPS performance checks were performed in accordance with Section 3.2 of the FPM. Two observations of position were made from two different DGPS base stations, while the launches were rafted together with their GPS antennae within 2-3 meters of each other.

The SWMB launches (VN 2121, 2123, 2126) used a Position and Orientation System for Marine Vessels (POS/MV) to determine their heading. The POS/MV delivers heading measurements by two distinct methods. First, the Dynamic Heading Alignment determines the vessel's heading by using data supplied by the Inertial Measurement Unit (IMU) and GPS receivers to achieve a 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 that they receive. The error from this method is largely due to noise, but it exhibits no drift. The POS/MV uses the advantages of each method to compensate for the disadvantages of the other to arrive at an optimal attitude accuracy of 0.05° and a heave accuracy of 0.1 meters.

* Filed with the hydrographic data.

I. SHORELINE *See Eval Rpt., Section J.*

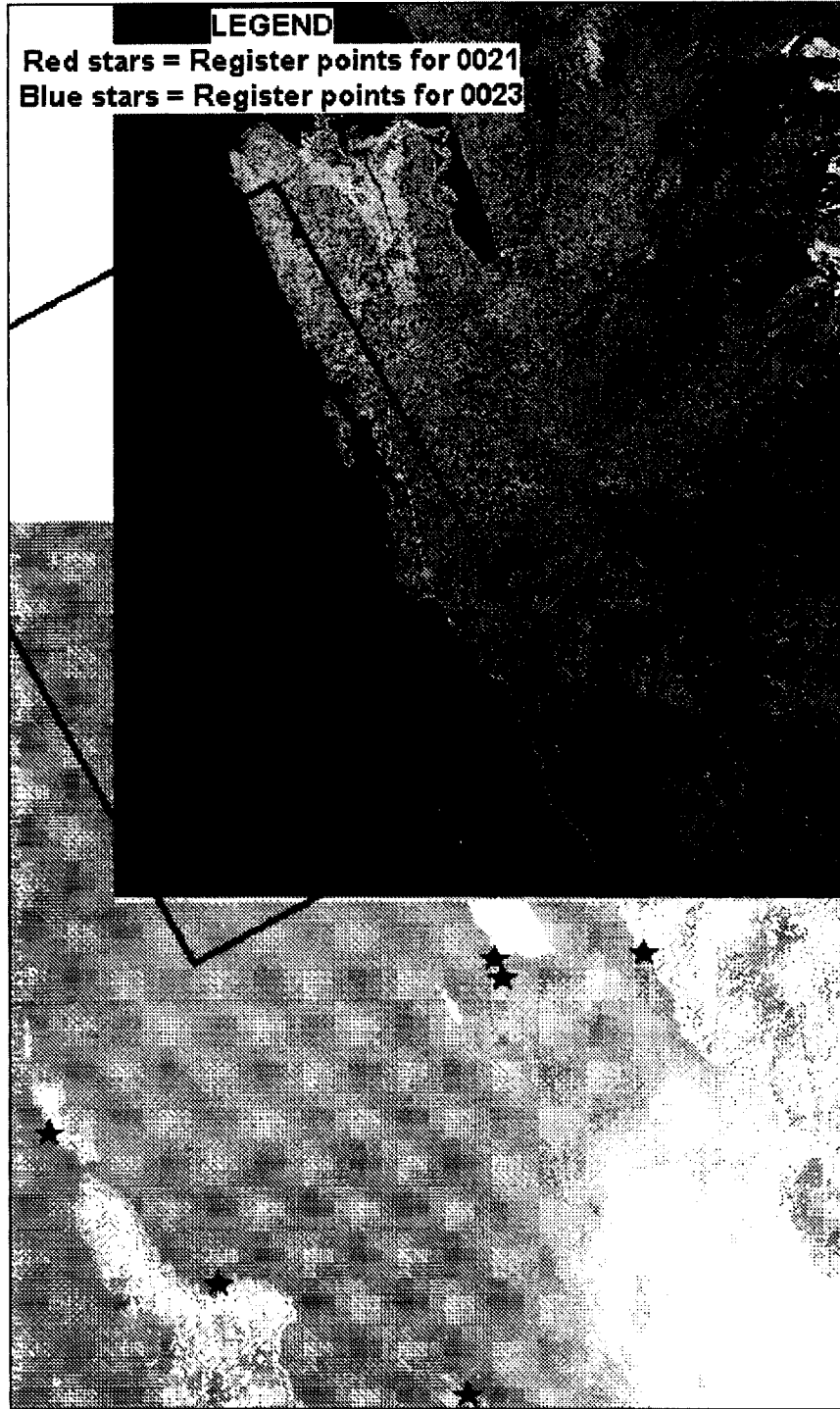
There was no official shoreline document supplied by N/CS341 for any of the eastern shoreline for the entire Lynn Canal project. Digitized shorelines using Chart 17316 and prior surveys provided insufficient quality for the area covered by H-10862. This problem was solved with the NASA Satellite photographs acquired from the U.S. Forest Service. These photographs were scanned and then registered into MapInfo 5.0 using the charted geographic positions of significant landmarks along the shoreline (see Table 2 and Illustration 2). The registered photos were digitized by ship personnel to provide a general idea of where the high and low tide water line was in the area of the survey. Features based on Chart 17316 at 1:10,000 scale were digitized as well. The digital manuscript and charted feature files were exported into Hypack as .DXF and .DGW formats, respectively, for field verification of shoreline features. This method proved to be remarkably reliable and was extremely accurate when compared to the detached positions, soundings, and tracklines.

Table 2. Reference points used to register NASA satellite photographs into MapInfo 5.0

Photo #	Point	Latitude (decimal degrees)	Longitude (decimal degrees)	Description of Geographic Location of the Registered Points
0021	1	58.633100	-134.953000	ESE point on Mab Island
0021	2	58.606190	-134.929900	North tip of islets south of Bridget Cove
0021	3	58.678904	-134.989040	Sea-ward most extend of Pt. Bridget
0021	4	58.669530	-134.922070	Peninsula tip 1.5km south of Echo Cove opening
0023	1	58.504040	-134.991372	Smaller point on the North side of Benjamin Island
0023	2	58.487408	-134.918825	Northern tip of Shelter Island
0023	3	58.607614	-134.935428	The most immediate ledge pointing south located south of Bridget Cove
0023	5	58.555356	-134.868210	Along the east shore, east of Benjamin Island
0023	6	58.551299	-134.909012	Southern most end of Benjamin Island
0023	6	58.554167	-134.911596	Ledge north of the southern most end of Benjamin Island
0023	7	58.526822	-135.040937	WSW side of Ralston Island on ledge

Limited shoreline verification was conducted in accordance with the Project Instructions. 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 NALL are the hydrographer's representation of the shoreline while slowly transiting along the shore, and are intended to aid chart compilation. *Shoreline verification conducted by the hydrographer has been analyzed during office processing and shown on the smooth sheet as warranted.* Shoreline manuscript and field features were compared to an enlargement of chart 17316 plotted by RAINIER personnel, as well as digital overlay of data on the BSB chart image in MapInfo.

Illustration 2. Points used to register NASA satellite photographs for H-10862 shoreline



The charted features (from Chart 17316) and the digitized manuscript features created from the NASA photos, matched the shoreline as observed in the field during the current survey except for the following discrepancies (Table 3):

Table 3. H-10862 vs. Digital Manuscript and Chart 17316

Fix #	Digital Manuscript	Charted Features	Geographic Location	Observed Feature	MLLW* elevation (in meters)	
40924	Rock		58° 35' 16.405" N 134° 54' 06.640" W	<u>Smooth Sheet Portrayal</u> Charted Rock not found after 5-min. visual search at low water - misinterpretation of NASA photo by RAINIER personnel digitizing features [3m visibility, 30m-search radius].	5.74 17.7 Feet	Concur
40934	None	None	58° 35' 17.821" N 134° 54' 19.380" W	New Ledge- swm extent <u>Extension of shoreline ledge</u>	-2.146 (15)	Concur
40975	Islet		58° 36' 05.210" N 134° 55' 11.033" W	Charted Islet not found after 5-min. visual search at low water - misinterpretation of NASA photo by RAINIER personnel digitizing features [3m visibility, 30m-search radius].	17.861 57.7 Feet	Concur
40996	None	None	58° 36' 30.024" N 134° 55' 53.932" W	New Rock Outcropping <u>Extension of shoreline ledge</u>	-2.79 (10)	Concur
41032	None		58° 36' 21.709" N 134° 56' 02.671" W	New Rocky ledge - swm extent <u>Extension of shoreline ledge</u>	-1.1 (4)	Concur
41075	None	None	58° 37' 12.813" N 134° 56' 41.734" W	New Rock	-0.12 (1)	Concur
49000	None	None	58° 35' 22.083" N 135° 01' 09.576" W	Princess Sophia Wreck	16.8 Least Depth = 13.84 =	7.1 Fathoms
51246	Rock		58° 38' 46.961" N 134° 58' 12.143" W	Charted Rock not found after 5-min. visual search at low water - misinterpretation of NASA photo by RAINIER personnel digitizing features [3m visibility, 30m-search radius].	114.2 374 Feet	Concur
51294	None	None	58° 38' 01.267" N 134° 56' 52.000" W	New Islet <u>Position revised to reflect range and bearing from detached position.</u>	-3.8	
51295	None	None	58° 38' 17.134" N 134° 57' 13.320" W	New Rock	-0.3 (2)	Concur
51313	None	None	58° 37' 32.577" N 134° 56' 48.063" W	New Reef - southern extent	-0.2 (1)	} Define some features
51315	None	None	58° 37' 33.353" N 134° 56' 48.595" W	New Reef - center	-0.3 (1)	
51317	None		58° 37' 40.918" N 134° 56' 47.827" W	Islet - northern extent	-14.3 (32) MHW	} Define some features
51318	None		58° 37' 36.838" N 134° 56' 47.876" W	Islet - southern extent	-14.3 (32) MHW	
51336	None	None	58° 38' 03.524" N 134° 57' 37.514" W	New Ledge - swm extent <u>Extension of shoreline ledge</u>	-2.0 (7)	Concur

* Corrected for approved tides

Fix #	Shoreline Manuscript	Charted Features	Geographic Location	Observed Feature	MLLW elevation (in meters)
51337	None	None	58° 38' 02.825" N 134° 57' 37.440" W	Smooth Sheet Portrays 1 New Rock (Part of ledge)	-0.3 (1)
53375	None	None	58° 35' 28.154" N 135° 01' 13.626" W	Reef - W swm extent Concur	-4.23 (14)
53376	None	None	58° 35' 30.004" N 135° 01' 10.166" W	Reef - N swm extent Concur	-4.23 (14)
53377	None	None	58° 35' 25.756" N 135° 01' 14.460" W	Reef - SE swm extent Concur	-4.23 (14)
53378	None	None	58° 35' 25.103" N 135° 01' 06.385" W	Reef - S swm extent Concur	-4.23 (14)

Concur

Define Same Feature

The hydrographer recommends that the feature located in the vicinity of 58° 36' 20.62" N, 134° 55' 43.16" W, south of Bridget Cove 1.4 nm, should remain depicted on the chart as two islets connected by a rocky shoal shelf. Although no measurements were taken during shoreline verification, it appears that the feature remains above water at all stages of tide as no soundings were acquired between the two charted islets. The shoreline manuscript based on the NASA photographs was extremely accurate in depicting the feature. Islands surrounded by ledge have been portrayed on the smooth sheet from GC-10424.

Concur

The hydrographer recommends that the northern extent of Mab Island be extended on the chart approximately 100m to the northwest, to approximate position of 58° 38' 29.07" N, 134° 57' 48.78" W, as depicted by the shoreline manuscript based on the NASA photographs. Although no measurements were taken during shoreline verification, it appears that the seaward most extent of the ledge corresponds with the shoreline manuscript as no soundings were acquired between the broken ledge and the island. Furthermore, the lack of soundings between the island and the ledge extent illustrate its shoal characteristic. Concur with clarification

* The area described by the hydrographer has been shown on the smooth sheet as an islet surrounded by a ledge, connected to MAB ISLAND. Source for this information is GC-10424 and Survey Soundings.

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" within the bounds of the survey. Manuscript shoreline source for smooth sheet is GC-10424.

Concur with Clarification

J. CROSSLINES

VBES crosslines agreed within 1-5 meters with mainscheme hydrography. There was a total of 39.23 nautical miles of crosslines, comprising 34.2% of mainscheme hydrography.

Comparisons were made between soundings collected by VBES, SWMB, and SeaBeam.

1. Comparison between Vertical Beam Echo Sounder vs. Shallow-water Multibeam

In depths less than 65 meters, VBES data compared well to SWMB data, within 1-3 meters. In depths greater than 65 meters, the two systems still compared well, within 3-5 m. Generally in steep and deep areas, discrepancies between the two data types were observed.

2. Comparison between Vertical Beam Echo Sounder vs. SeaBeam 1050D MkII

At depths greater than 300m, the SeaBeam data varied from the VBES data approximately 1-15 meters, with the SeaBeam data generally shoaler in depth. At depths less than 300 meters, SeaBeam and VBES agreed within 1-7 meters. In flat areas, the two compared well, regardless of depth (generally within 1- 5 meters). As seen with the VBES vs. SWMB, in steep and deep areas (greater than 60 meters), there are some significant discrepancies between the ship and singlebeam data. Due to the signal strength of the SeaBeam and its design for deeper water, the SeaBeam data should supersede VBES data at depths greater than 250 meters.

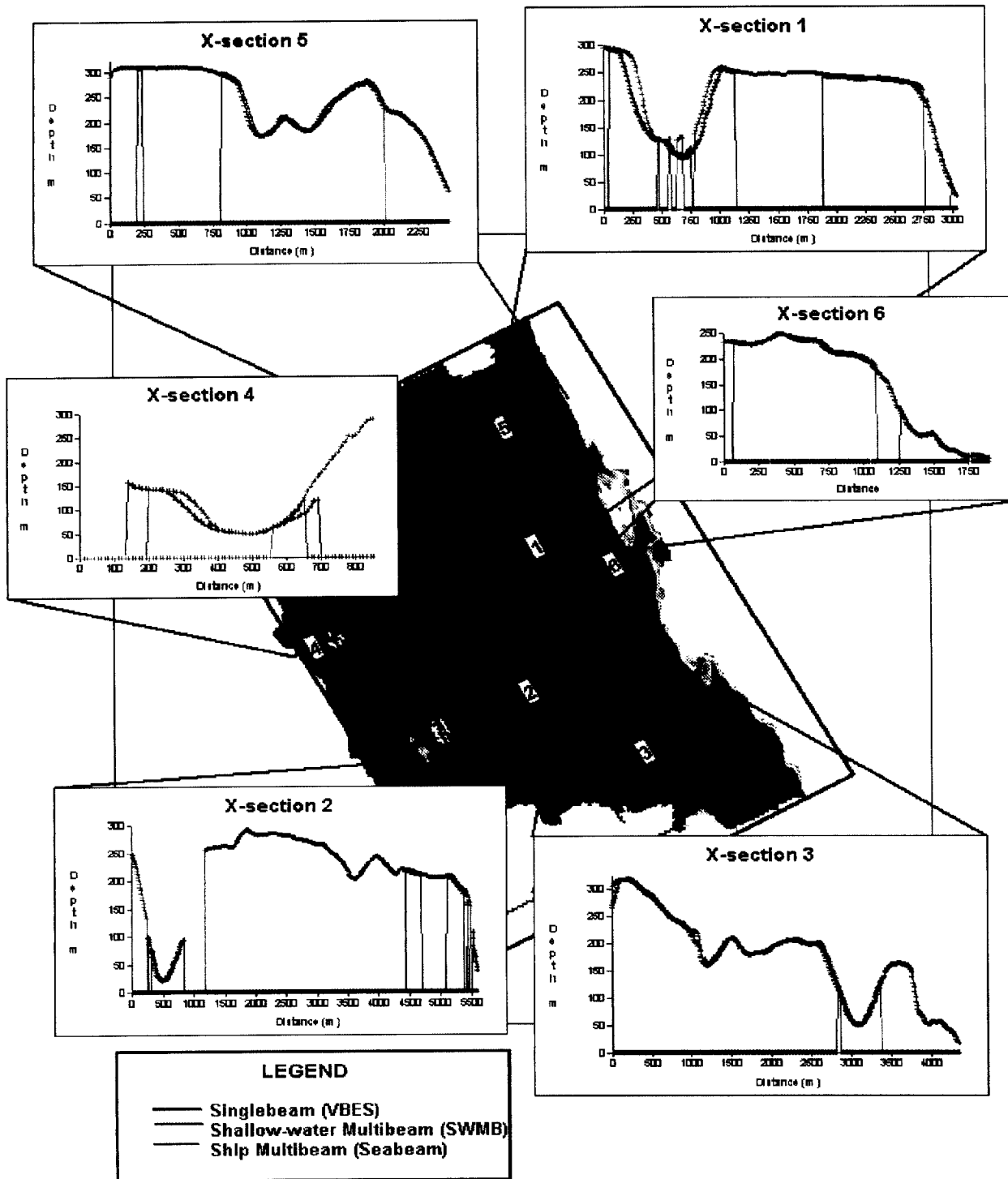
3. Comparison between Shallow-water Multibeam vs. SeaBeam 1050D MkII

At depths greater than 70 meters, the SeaBeam and SWMB compared well, within 1-3 meters. The SeaBeam did not collect data in shoal areas already covered by SWMB.

4. Comparison between Vertical Beam Echo Sounder vs. Shallow-water Multibeam vs. SeaBeam 1050D MkII

When comparing all three data types, the depths generally agree well to each other, within 1-10 meters. Illustration 3 demonstrates a simple analysis (performed using Vertical Mapper in MapInfo 5.0) of cross-sections in areas with all three data types.

Illustration 3.



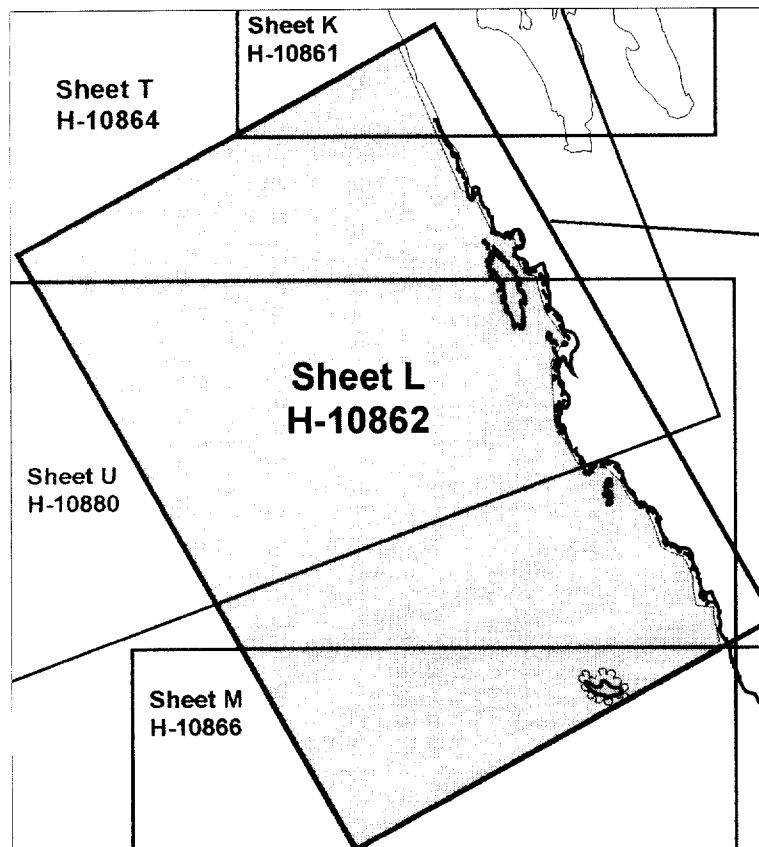
K. JUNCTIONS See Eval Rpt., Section L.

The following table (Table 4) and Illustration 4 depicts contemporary surveys which junction with H-10862:

Table 4. Junctions with H-10862

Registry #	Sheet Letter	Scale	Date	Junction side
H-10861	Sheet K	1:10,000	1999	North
H-10867 6	Sheet M	1:10,000	1999	South
H-10880	Sheet U	1:20,000	1999	¾ of Survey – southern end
H-10864	Sheet T	1:20,000	1999	¾ of Survey – northern end

Illustration 4. Surveys that junction H-10862 (blue dotted area)



Soundings on these 1999 surveys were found to be in good agreement, matching within 1-3 meters, except at the extreme north-east corner of this survey where the deepness and extreme steep slope of the area possibly produce larger differences between soundings from Sheet K (H-10861) and this survey. This may be particularly significant when comparing data collected with a Knudsen and that using a DSF6000. *Concur*

The following table (Table 5) lists a few differences found between H-10861 and the present survey.

Table 5. H-10862 vs. H-10861

H-10862 Depth (m)	Fix #	Geographic Position	H-10861 Depth (m)	Fix #	Geographic Position
81.6 (44 Fms)	11191	58°40'7.459"N 134°59'15.766"W	63.77 (34-42 Fms)	50467	58°40'7.378"N 134°59'15.685"W
175.4 172.6 (69 Fms)	50013	58°40'0.675"N 134°59'45.682"W	137.9 (75 Fms)	50343	57°46'7.314"N 134°59'46.148"W
114.0 (62 Fms)	10090	58°39'52.992"N 134°59'34.084"W	104.2 (60 Fms)	51223	58°39'52.882"N 134°59'34.221"W
133.2 (73 Fms)	10623	58°39'31.875"N 134°58'51.660"W	103.2 (56 Fms)	50079	58°39'31.881"N 134°58'51.263"W

See section F., Sounding Equipment, for further details. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum

L. COMPARISON WITH PRIOR SURVEYS See Eul Rpt., section M

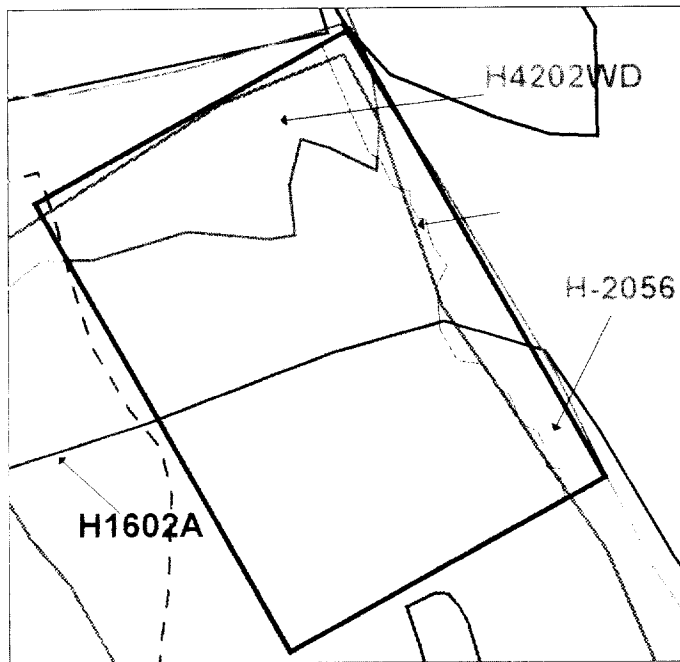
The following table and Illustration 5 depict the four prior surveys conducted in the H-10862 area:

Table 6. Prior surveys covering H-10862

Registry #	Scale	Date	Junction side
H-4202 ✗	1:40,000	1921	Northern section
H-2056 ✓	1:40,000 ✓	1890 ✓	Entire survey ✓
H-3985WD ✓	1:20,000 ✓	1911 ✓	Entire survey ✓
H-1602A ✗	1:40,000	1884	Southern half

* Provide no depth information for current chart

Illustration 5. Prior surveys that overlap H-10862 (purple dotted area)



Prior survey H-3985WD was not legible, so it was not used in the comparison.

The prior survey H-1602A contained only a few soundings, which were deeper than the present survey. (See comment above)

In comparing the present survey with H-2056, which supplies most of the soundings for Chart 17316, the majority of the prior survey soundings were found to be in good agreement, within 1-2 fathoms. The least depths from the current survey were more shoal or in agreement with H-2056 with a few exceptions (see Table 7). As similar depths were found within a 500m radius of the prior depth location, the discrepancies are likely due to positioning* problems for the 1890 survey. * Erroneous leadline depths may also account for differences.

Table 7. Prior H-2056 vs. H-10862

H-2056 Depth (fm)	H-10862 Depth (fm)	H-10862 Fix #	Geographic Position	Comments
12 1/4 ✓	2.5 ✓	71066	58° 35' 34.9" N ✓ 135° 01' 22.6" W	Present survey shows shoalest sounding for the position of prior sounding (see Illustration 6.).
45 ✓	37.2 ✓	72271	58° 37' 23.3" N ✓ 134° 59' 46.617" W	Present survey shows shoalest sounding for the position of prior sounding. Concur
193 ✓	178.3 ✓	103534	58° 37' 31.4" N ✓ 135° 03' 28.233" W	Depth from present survey in immediate area of charted prior sounding (see Illustration 7). Concur
" " ✓	193 ✓	103657	58° 37' 31.6" N ✓ 135° 04' 01.477" W	Position of prior sounding (193-fm) is incorrect – Hydrographer recommends using present survey location for 193 fm (see Illustration 7). Concur

27 22 ✓	24.5 ✓	72078	58° 36' 32.9" N ✓ 135° 03' 13.532" W	Present survey shows shoalest sounding for the position of prior sounding. <i>Concur</i>
188 ✓	108.6 ✓	94954	58° 36' 59.9" N ✓ 134° 59' 32.162" W	Depth from present survey in immediate area of charted prior sounding (see Illustration 8) <i>Concur</i>
" "	188.2 ✓	91842	58° 36' 47.4" N ✓ 134° 59' 57.627" W	Position of prior sounding (188-fm) is incorrect – Hydrographer recommends using present survey location for 188.2 fm (see Illustration 8) <i>Concur</i>
10 feet	24.9-fm	12112	58° 37' 19.3" N 134° 56' 48.3" W	Depth from present survey in immediate area of charted prior sounding (see Illustration 9) <i>Concur</i>
" "	1.4-fm	12145	58° 37' 09.7" N 134° 56' 42.9" W	Position of prior sounding (10 feet) is incorrect – Hydrographer recommends using present survey location for 1.4 fm (see Illustration 9) <i>Concur</i>

Illustration 6. Prior H-2056 vs. H-10862

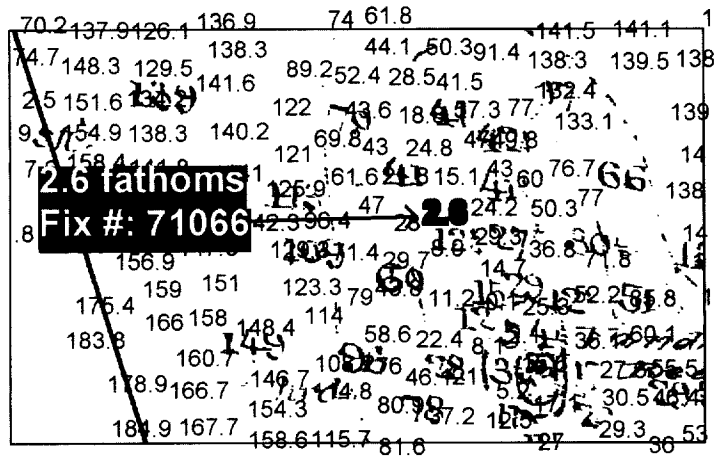


Illustration 7. Prior H-2056 vs. H-10862

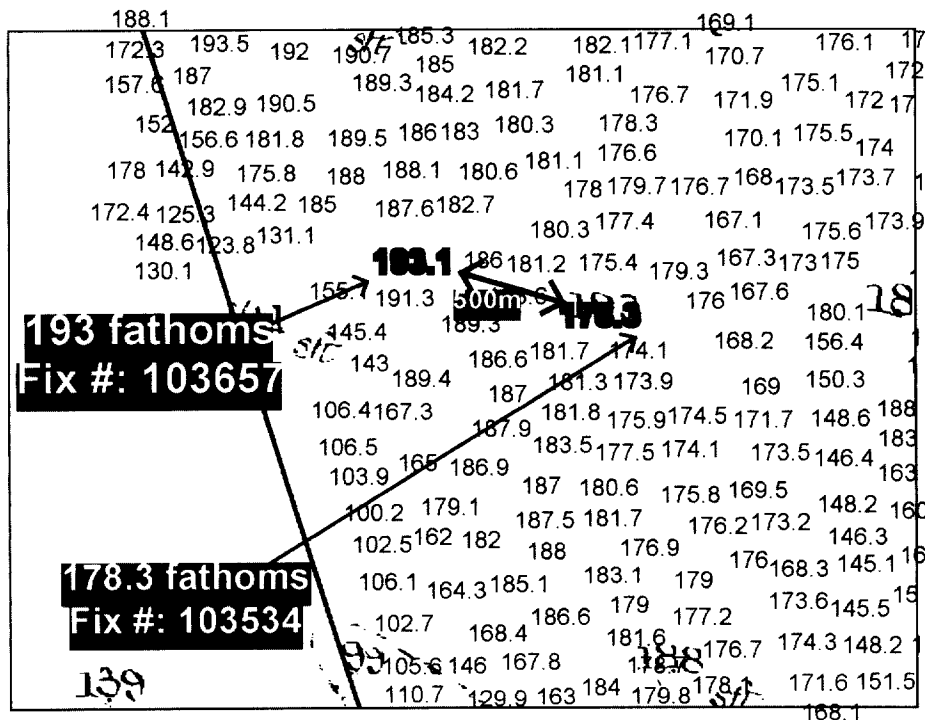


Illustration 8. Prior H-2056 vs. H-10862

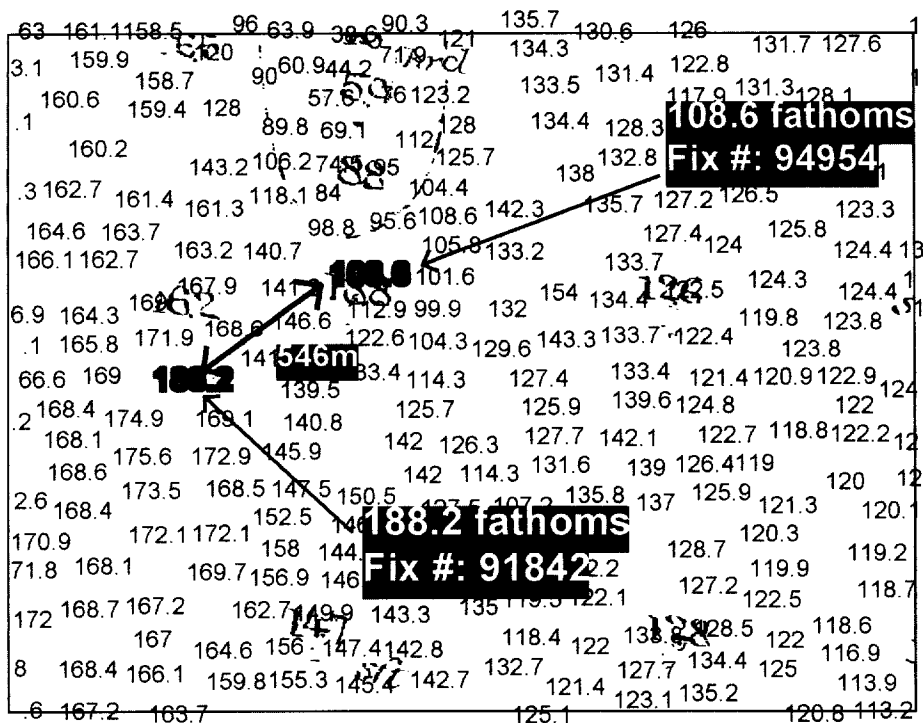
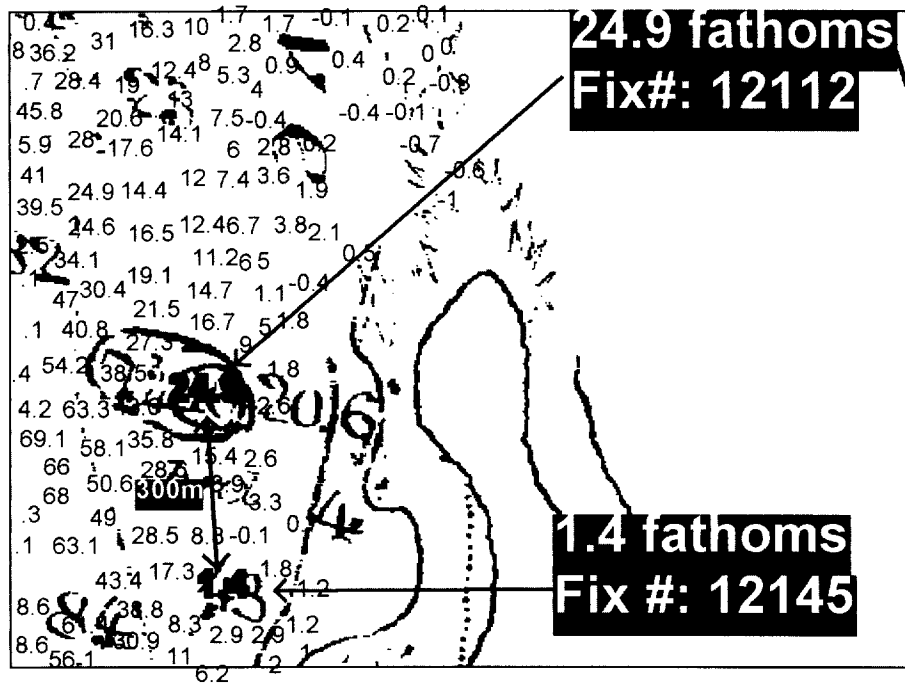


Illustration 9. Prior H-2056 vs. H-10862



In comparing the present survey with prior H-4202, all prior soundings were shoaler. This discrepancy is likely due to the method of wire dragging at deep depths. The following table (Table 8) illustrates the differences in depths.

Do not Concur See note below

Table 8. Prior H-4202 vs. H-10862

H-4202 Depth (feet) *	H-10862 Depth (feet)	H-10862 Fix #	Geographic Position
200 20C	933 (155 FMS) ✓	105568	58° 38' 43.257" N 135° 01' 45.125" W ✓
558 55B	997 (166 FMS) ✓	90713	58° 38' 27.886" N 135° 02' 12.672" W ✓
180 18C	622 (103 FMS) ✓	87737	58° 38' 00.568" N 135° 00' 21.975" W ✓
588 58B	974 (162 FMS) ✓	88726	58° 37' 18.787" N 135° 00' 27.347" W ✓

* These values are not correct. Depths listed are actually position numbers on the wire drag survey. Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. *Concur*

M. ITEM INVESTIGATION REPORTS

Although there were no AWOIS items within survey H-10862, one item was investigated:

ITEM : Wreck	DN: 158
CHART #: n/a	VESNO: 2124
ITEM DESCRIPTION: Princess Sophia off Vanderbilt Reef	
SOURCE: Local history	

Geographic Position

	GEOGRAPHIC POSITION
OBSERVED:	58° 35' 22.068" N 135° 01' 9.6002" W
FIX NUMBER:	49000
POSITIONED BY:	DGPS
DATUM:	MLLW (NAD 83)

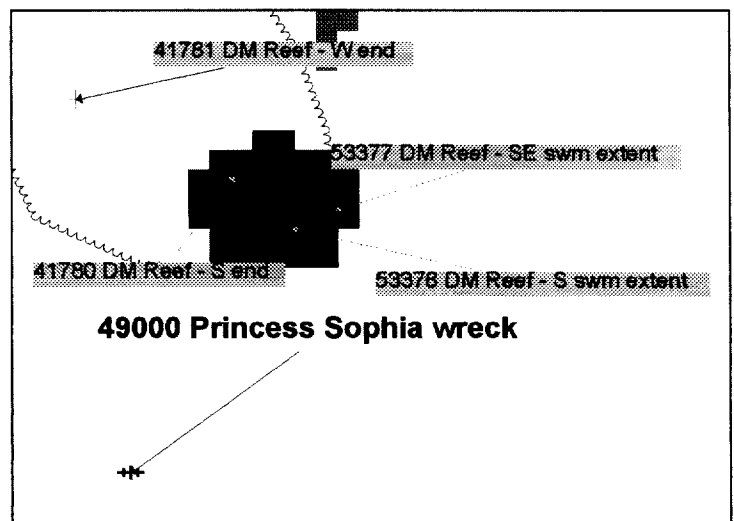
METHOD OF INVESTIGATION: Dive for Least Depth
Least Depth: 13.84 m (7.57 fathoms); Range: 0m, Bearing 308M *
FINDINGS: Wreck, Submerged

* Least depth based on actual tides is 13.04 meters (7.1 Fathoms)

Charting Recommendations

The hydrographer does not find the wreck to be a danger to navigation. It is of interest for cultural purposes only. *Concur*

Illustration 10. Princess Sophia Wreck



N. COMPARISON WITH THE CHART *See Encl Rpt., section O.*

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

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

* Latest Edition 28th, Sept. 12, 1998

The survey was compared with Chart 17316 and Chart 17300 and was in good agreement, generally within 1-2 fathoms. A few differences were noted and are as follows (Table 9):

Table 9. H-10862 vs. Chart 17316 and Chart 17300

Chart affected	Chart Depth (fm)	H-10862 Depth (fm)	H-10862 Fix #	Geographic Position
17316 ✓ 17300	22 ✓	24.5 ✓	72078	58° 36' 32.9" N ✓ 135° 03' 13.532" W
17316 ✓ 17300	45 ✓	37.2 ✓	72271	58° 37' 23.3" N ✓ 134° 59' 46.617" W
17316 *	1 3/4	1.3	12145	58° 37' 09.7" N 134° 56' 42.9" W

* The entire area between Mab Island and the eastern shoreline, as well as the north and south opening of Bridget Cove were covered with SWMB, acquiring 100% coverage. This development revealed that the charted 1 3/4 fathom sounding was ^{likely position in error} misplaced approximately 300m north of a ^{the charted 1 3/4} 1 3/4 fathom SWMB sounding at Lat. ^{Long.} 58° 37' 19.3" N, ^{originate from H-2056 (1890)} 134° 56' 42.9" W.

Non-sounding features are discussed in Section ^I J. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

Dangers to Navigation ✓

Two dangers to navigation were discovered during the survey and reported to the Seventeenth Coast Guard District (Table 10). *Correspondence is attached to this report.*

Table 10. Dangers to Navigation found on H-10862

ITEM	Depth (fm)	Latitude	Longitude
Shoal Depth	1.1 ✓	58° 38' 5.634" N	134° 57' 05.888" W
Shoal Depth	2.4 ✓	58° 35' 34.920" N	135° 01' 22.697" W

O. ADEQUACY OF SURVEY ✓

Survey H-10862 is complete and adequate to supersede prior soundings and features in their common areas. *Concur*

P. AIDS TO NAVIGATION ✓

Vanderbilt Reef Light (#23860) is located at 58° 35.5' N, 135° 01.1', with characteristics of Fl W 2.5s. The light is on a skeleton tower on a concrete pier 36-ft in height, and has a 6-nm range. The light is listed as being higher intensity beam up channel. This light was recovered and observed on DN 116. The light is charted adequately on chart 17316. Refer to Section Q in the Appendices for more information on the discrepancy between the charted position and the surveyed position. ** Section Q, Descriptive Report Insert is attached to this report.*

Q. STATISTICS ✓

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

R. MISCELLANEOUS ✓

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

Due to the proximity to the road leading to Auke Bay, small pleasure crafts were observed in the area as well as kayakers. Bridge Cove appears to be a safe harbor for small vessels to anchor within. *Concur*

S. RECOMMENDATIONS ✓

The hydrographer recommends that photogrammetric shoreline be acquired for survey areas before the hydrographic field party begins the survey. Precise, low-water shoreline information can greatly facilitate the acquisition of soundings and expedite the shoreline verification process. *Concur*

T. REFERRAL TO REPORTS ✓

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

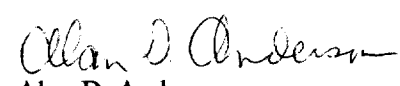
<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-0340-RA Horizontal Control Report	July 1999	N/CS34
Project related data for OPR-0340-RA		N/CS34
OPR-0340-RA Coast Pilot Report		N/CS26

Respectfully Submitted,



Winli Lin
Senior Survey Technician

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer

Survey Information Summary

Project: **Project Name:**

Instructions Dated: **Project Change Info:**

Change #	Dated
1	3/30/98
2	4/14/99
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	2			1				
2121	2	2		1				
2122			1					
2123	1			1				
2124	1	1			1	2		1
2125	3	2	1		1	2		
2126	1	1						
2127								

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
1		95	500	58/34/06	095-103
				135/05/54	
3		104	340	58/34/18	104-115
				134/57/54	
7		116	302	58/36/02	116-123
				135/00/08	
15		159	67	58/29/25	158-
				134/57/25	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
SEA2C	00 hr 00 min	X0.99
SEA3	00 hr 00 min	X0.98

Tide Gage Information

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

Statistics Summary

Type	Total:
DEV	36.9
DIVE	1
DP	24
MBMS	35.68
MBXL	9.86
MS	114.55
S/L	9.2
SPLIT	21.64
SWMB	54.75
XL	39.23

Percent XL:	34.2%
SQNM:	17



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

NOAA Ship RAINIER
 June 13, 1998

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

**ADVANCE
 INFORMATION**

Dear CDR Hamblett:

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

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

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

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



**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
Captain, NOAA
Commanding Officer

Attachments

cc: NIMA
PMC
N/CS261
N/CS34

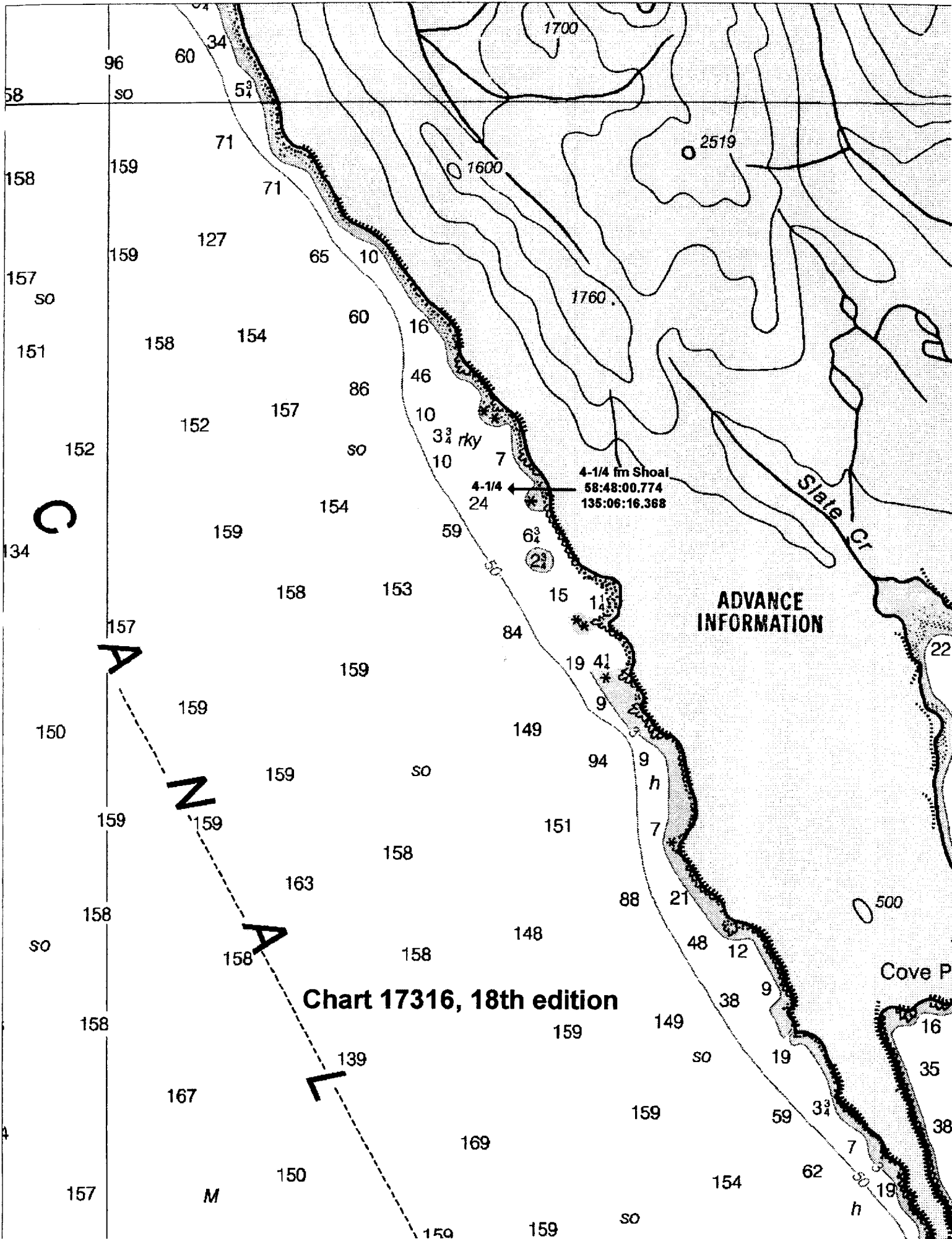


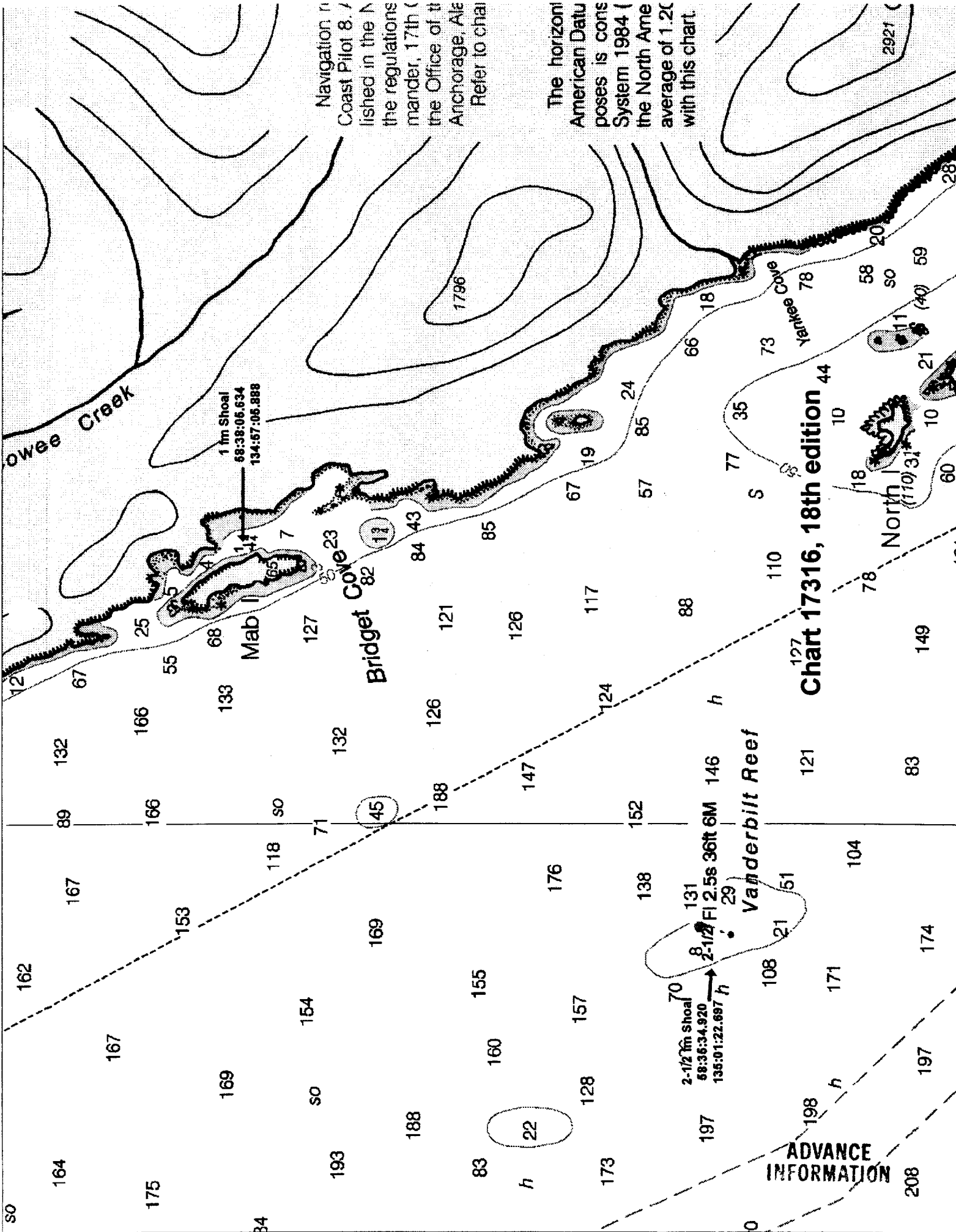
Chart 17316, 18th edition

ADVANCE INFORMATION

4-1/4 m Shoal
58:48:00.774
135:06:16.368

Slate Cr

Cove P

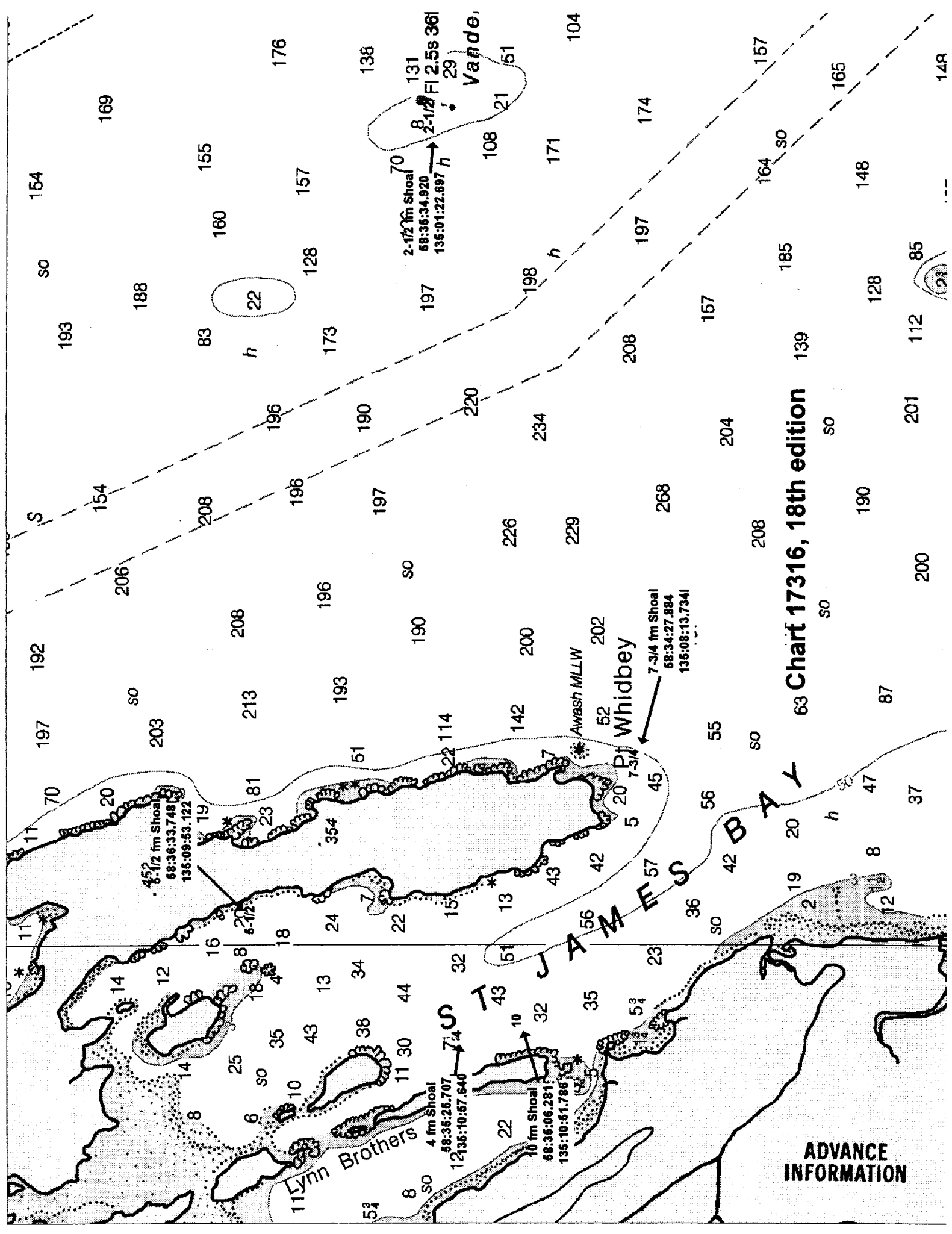


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Chart 17316, 18th edition

**ADVANCE
INFORMATION**



63 Chart 17316, 18th edition

ADVANCE INFORMATION

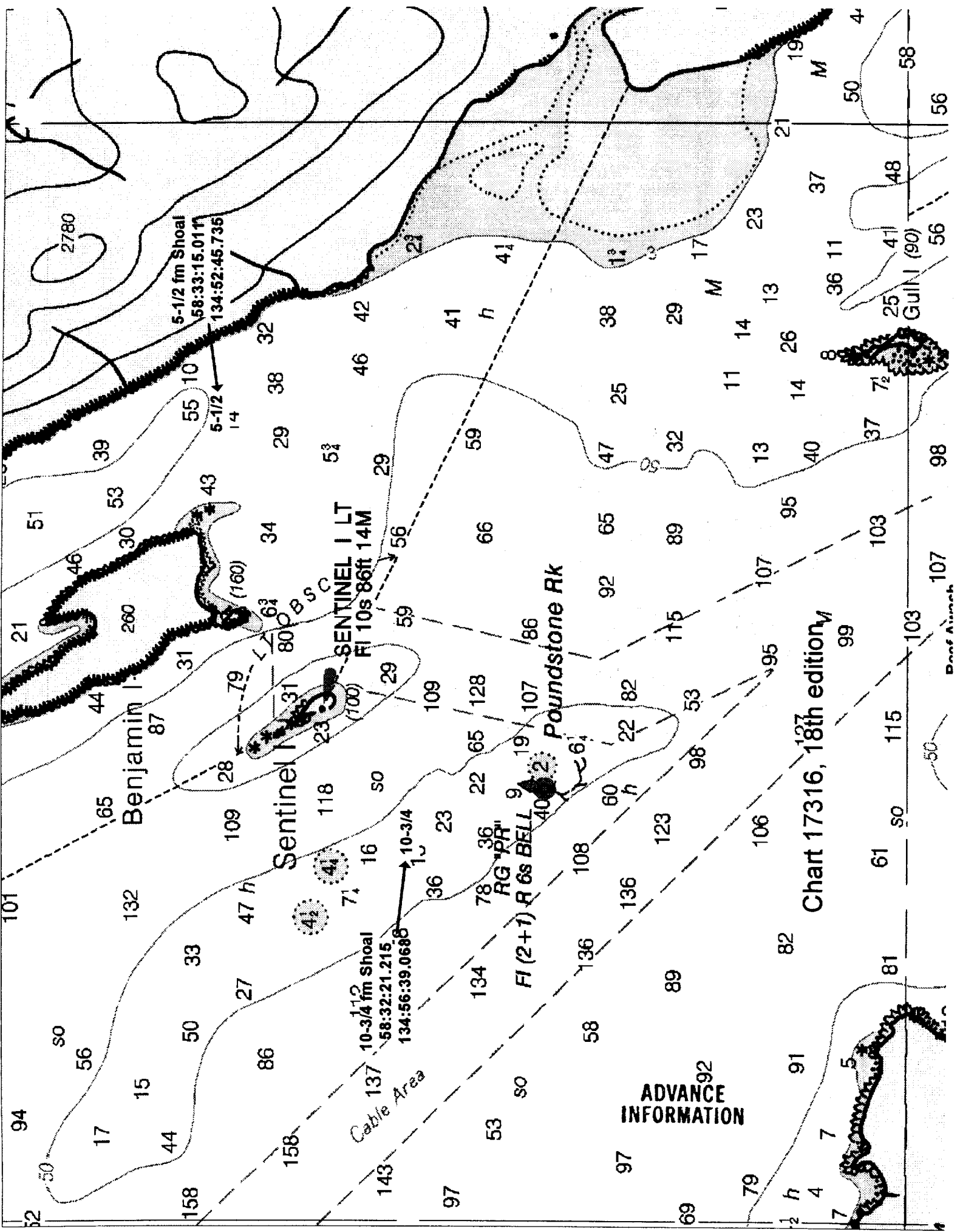


Chart 17316, 18th edition

ADVANCE INFORMATION

Prof. Atchaf

**ADVANCE
INFORMATION**

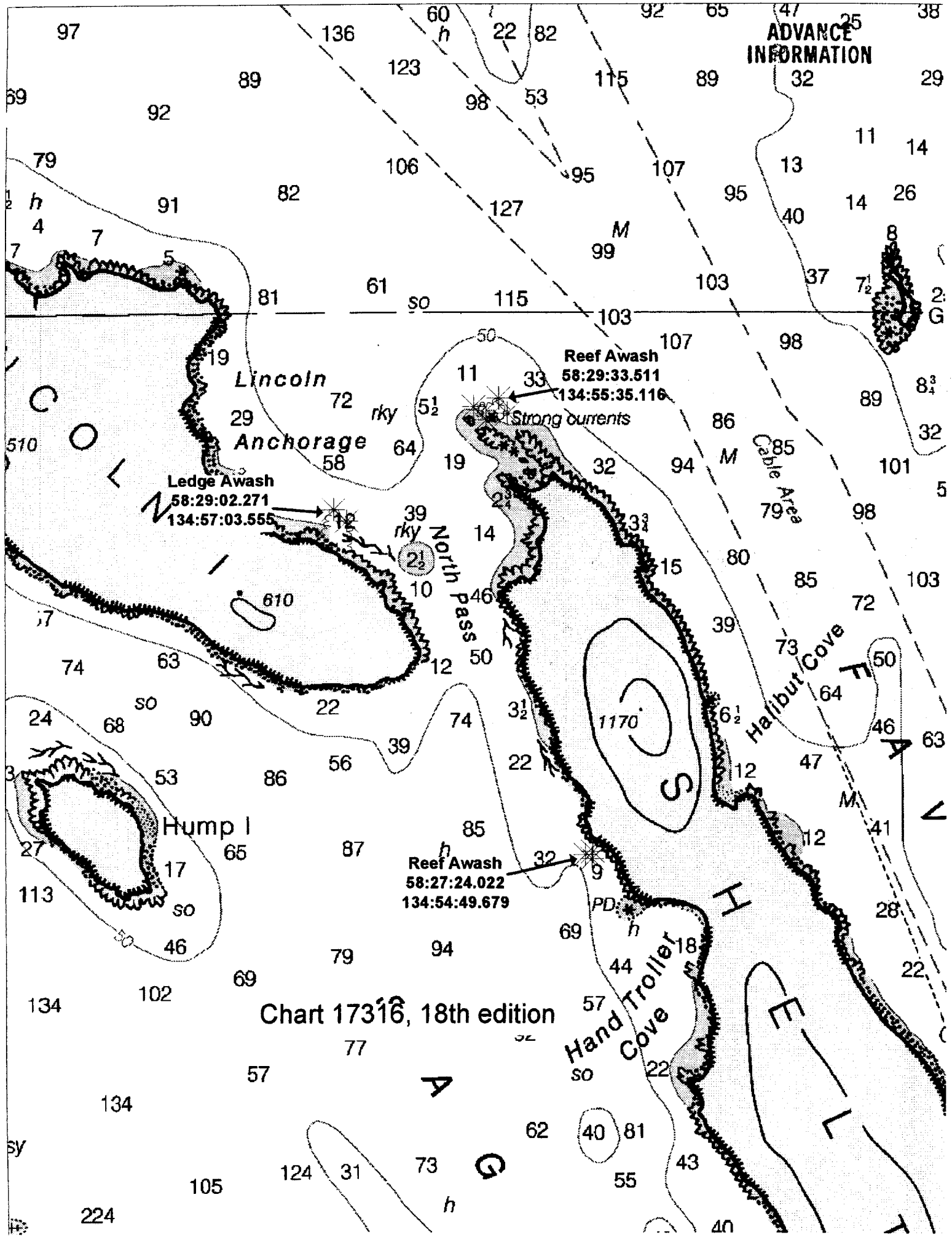


Chart 17316, 18th edition

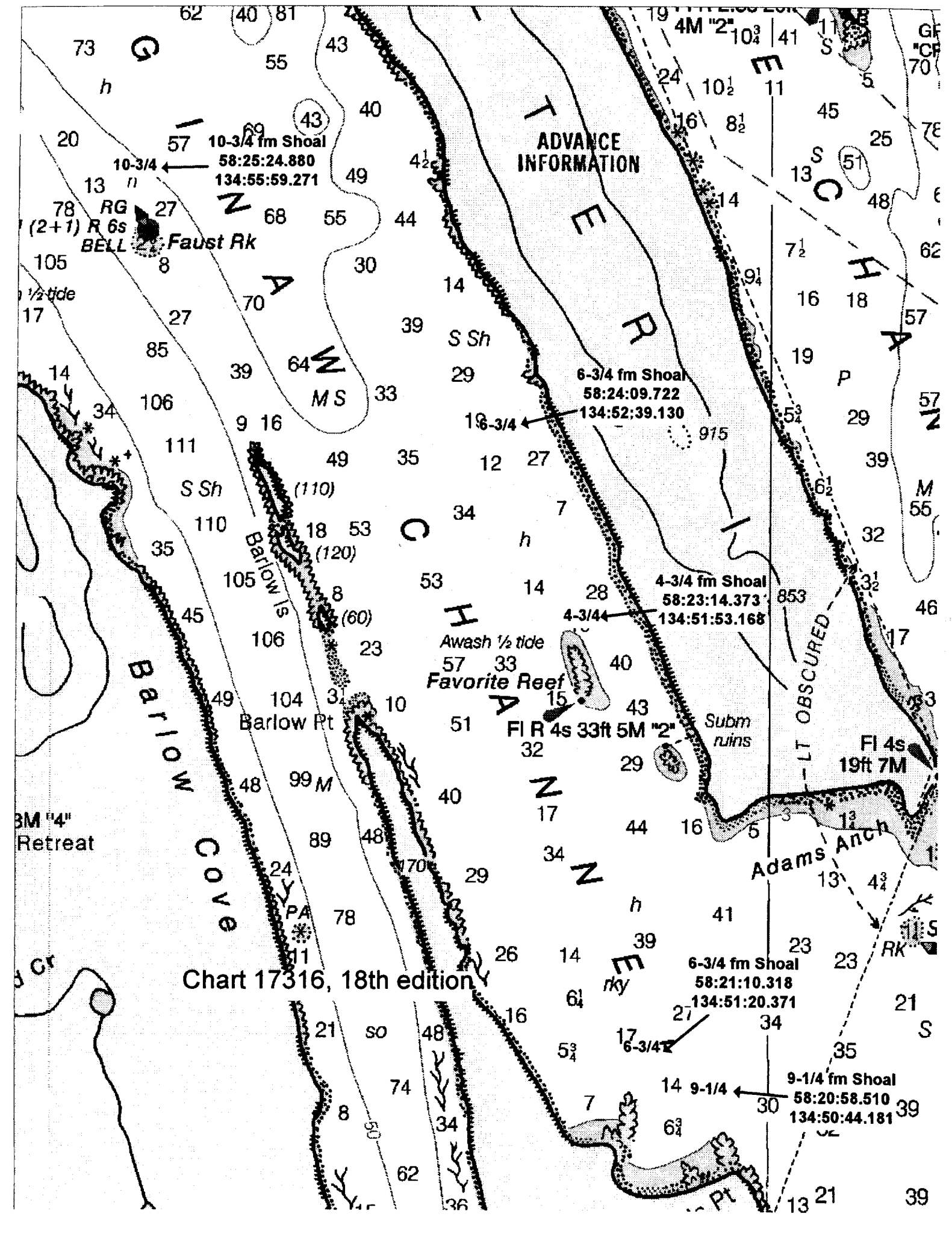


Chart 17316, 18th edition

ADVANCE
INFORMATION

LT OBSCURED

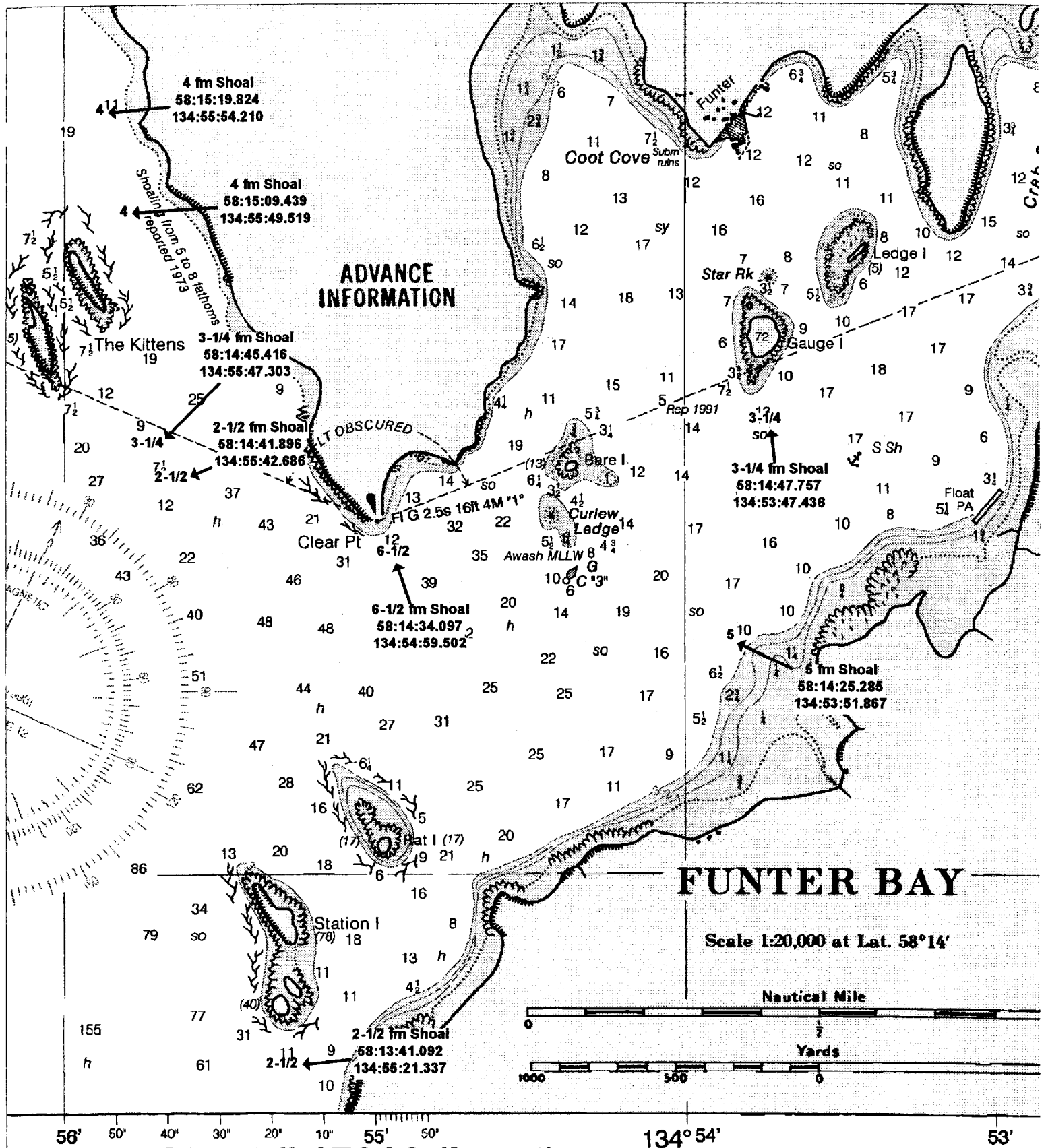
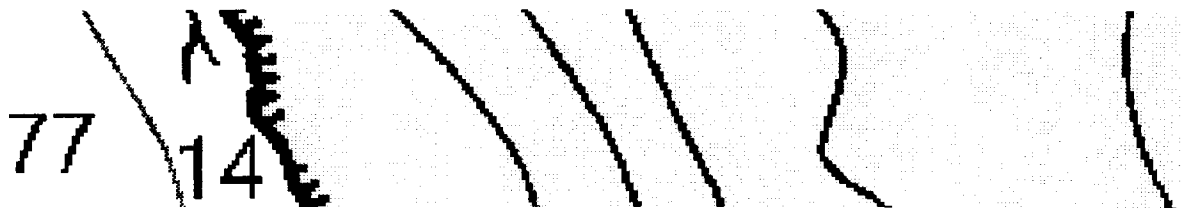


Chart # 17316 (inset)



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.

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

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

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

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

/signed/

Alan D. Anderson
Captain, NOAA
Commanding Officer

Section Q: Descriptive Report Insert

Name of Aid: Vanderbilt Reef Light ✓
 Light List #: 23860

Method of Positioning GPS: DGPS: Other: _____

Positioning Information

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	58/35.5	135/01.1
Survey Pos.	58/35/27.45789	135/01/07.6320

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	498934.3	6494585.3
Survey Pos.	498907.9	6494506.8

Difference between Charted and Surveyed Position: Distance: 83 meters
 (Bearing from Surveyed to Charted Position) Bearing: 19 deg T

Characteristics

Do characteristics match Light List? Yes No

If no, what are the characteristics? _____

Does the aid adequately serve its apparent purpose? Yes No

If no, why not? _____

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

Date Est: _____

Maintained By: _____ Private? Yes No

Is aid seasonally maintained? Yes No

Frequency of Maintenance: _____

Apparent Purpose: _____

Other Information:

See OPR-O340-RA Horizontal Control Report for details.

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

GEOGRAPHIC NAMES

H-10862

Name on Survey	Source of Name										
	A	B	C	D	E	F	G	H	K		
	ON CHART NO.	ON PREVIOUS SURVEY	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	RAND McNALLY ATLAS	U.S. LIGHT LIST			
ALASKA (title)	X	X									1
BENJAMIN ISLAND*	X	X									2
BRIDGET COVE	X	X									3
LYNN CANAL	X	X									4
MAB ISLAND	X	X									5
NORTH ISLAND	X	X									6
VANDERBILT REEF	X	X									7
YANKEE COVE	X	X									8
											9
											10
											11
											12
											13
											14
* Falls outside the											15
smooth sheet limits.											16
											17
											18
											19
											20
											21
											22
											23
											24
											25

Approved

Dennis R. ...
SEP 20 1999



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: October 19, 1999

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-0340-RA
HYDROGRAPHIC SHEET: H-10862

LOCALITY: Vanderbilt Reef to Pt. Bridget, AK
TIME PERIOD: April 8 - 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: 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: Juneau, AK and Skagway, AK were used as datum control for subordinate tide stations and for tidal zoning in this hydrographic survey. Accepted datums for these two stations have been updated recently and have changed significantly from previous values.

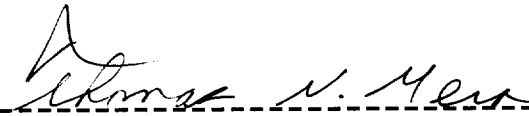
The current National Tidal Datum Epoch (NTDE) used to compute tidal datums at tide stations is the 1960-78 NTDE. Traditionally, NTDEs have been adjusted when significant changes in mean sea level (MSL) trends are found through analyses among the stations of the National Water Level Observation Network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



TIDE NOTE FOR HYDROGRAPHIC SURVEY SHEET H-10862 cont.

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>.


----- 10/19/99 -----
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

Final tide zone node point locations for OPR-O340-RA-99,
Sheet H-10862.

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 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			

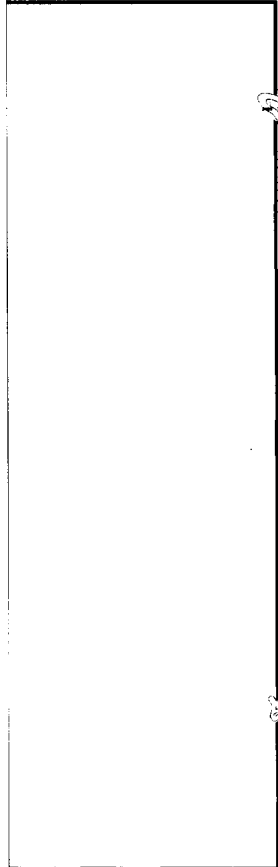
Final Tidal Zoning for OPR-0340-RA-99

Lynn Canal, AK - Sheet H-10862

SOUNDINGS IN FATHOMS

NATIONAL CHART COMING TO A POINT

VEGETATION
 The land is generally heavily wooded. The coastal bluffs are covered with the spruce forest. The higher elevation land is heavily wooded with the western hemlock. The higher elevation land is heavily wooded with the western hemlock. The higher elevation land is heavily wooded with the western hemlock.

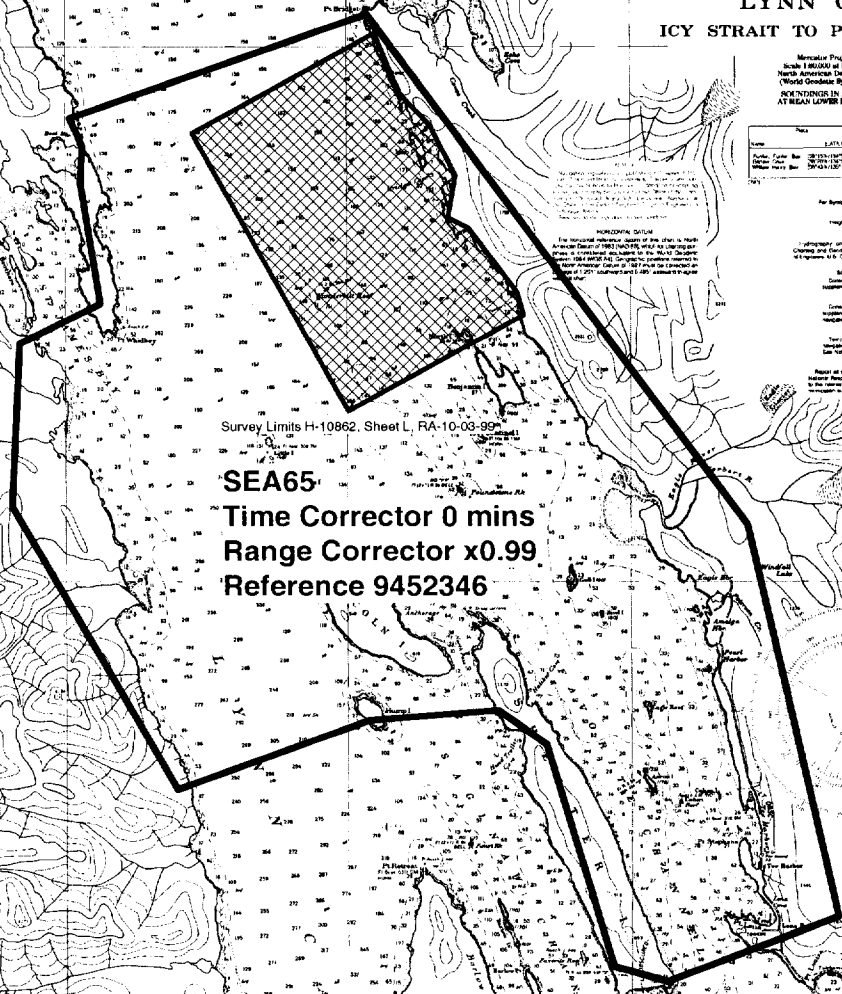


9452346 COVE POINT, BERNERS BAY

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

Merimatic Projection
 Scale 1:60,000 as of Lat. 66° 12' N
 North American Datum of 1983
 (World Geodetic System 1984)
SOUNDINGS IN FATHOMS
 AT MEAN LOWER LOW WATER

Year	Chart	Scale	Projection	Datum
1983	11000	1:60,000	Merimatic	NAD 83
1983	11000	1:60,000	Merimatic	NAD 83
1983	11000	1:60,000	Merimatic	NAD 83
1983	11000	1:60,000	Merimatic	NAD 83



Survey Limits H-10862, Sheet L, RA-10-03-99
SEA65
 Time Corrector 0 mins
 Range Corrector x0.99
 Reference 9452346

CAUTION
 Readings are given in fathoms. The soundings are based on the datum of Mean Lower Low Water. The soundings are based on the datum of Mean Lower Low Water. The soundings are based on the datum of Mean Lower Low Water.

CAUTION
 The soundings are given in fathoms. The soundings are based on the datum of Mean Lower Low Water. The soundings are based on the datum of Mean Lower Low Water. The soundings are based on the datum of Mean Lower Low Water.

9452318 BARLOW COVE

APPROVAL SHEET

for

H-10862

RA-10-03-99

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,



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

HYDROGRAPHIC SURVEY STATISTICS

H-10862

RECORDS ACCOMPANYING SURVEY: To be completed when survey is processed

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	NA
DESCRIPTIVE REPORT	1	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-10424
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	Chart 17316 18th Edition, July 18, 1998

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
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	195		195
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		20	20
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		47	47
*USE OTHER SIDE OF FORM FOR REMARKS			
TOTALS	195	67	262

Pre-processing Examination by M. Bigelow	Beginning Date 7/2/99	Ending Date 8/3/99
Verification of Field Data by J. Mayor, E. Domingo, B. Olmstead	Time (Hours) 195	Ending Date 1/27/2000
Verification Check by R. Davies	Time (Hours) 2	Ending Date 2/1/2000
Evaluation and Analysis by B. Olmstead	Time (Hours) 20	Ending Date 1/26/2000
Inspection by D. Hill, R. DAVIES	Time (Hours) 10	Ending Date 2/1/2000

EVALUATION REPORT

H-10862

A. PROJECT

The hydrographer's report contains a complete discussion of the project information.

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 mud and gravel. Depths generally range from one fathom along the shoreline and in areas of shoal developments, to over 200 fathoms along the western limits of the survey area.

C. SURVEY VESSELS

The hydrographer's report contains adequate information relating to survey vessels.

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 H-10862.

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

Section H and I of the hydrographer's report contain adequate discussions of horizontal control and hydrographic positioning.

The positions of horizontal control stations used during hydrographic operations are published and field values based on NAD 83. The geographic positions of all survey data are 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:	-1.171 seconds	(-36.238 meters)
Longitude:	6.476 seconds	(104.551 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.

During shallow water multibeam (SWMB) data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on HYPACK. The final positions are provided by the POS-MV which 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.

For IDSSS Ship's Multibeam, the satellite configuration, as indicated by HDOP, and the number of satellites is monitored visually on the IDSSS and receiver displays. Data are not collected when HDOP exceeds 4.0. In the event that the differential GPS corrector signal is lost, a switch to P-Code is made automatically by the receiver. Although P-Code accuracy is less than DGPS, at 0.5mm or better it is sufficient for a survey of 1:10,000 scale.

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

Shoreline map GC-10424, scale 1:20,000, was compiled on NAD 83 and applies to this survey. 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 was one MHW revision on this survey. The new feature is an islet shown on the smooth sheet at latitude 58/38/02.5N, longitude 134/56/47.5W. The islet was located by a bearing and range (approximately 60 meters) from the detached position. The islet has been shown in dashed red on the smooth sheet.

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 H-10862 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10861	1999	1:10,000	North
H-10864	1999	1:20,000	Northwest
H-10866	1999	1:20,000	South
H-10880	1999	1:20,000	West

The junctions with surveys H-10861 and H-10866 are of considerable spatial extent. Sounding agreement with H-10866 is good. However, H-10861 contained significant depth discrepancies. The cause of this problem is unknown. Soundings on survey H-10861 determined to be inconsistent with bottom topography have been rejected which resulted in good agreement between the surveys. A "Joins" note has been added to the smooth sheet to indicate the successful completion of the junctions.

The junctions with surveys H-10864 and H-10880 occur in deep water (30-200 FMS) and are complete. Soundings and depth curves are generally in good agreement. However, some sounding differences of 1-4 fathoms are readily evident. There appears to be no consistent trend toward a shoal or deep bias. A few soundings from H-10880 have been transferred in color within the common area to better delineate the bottom configuration and to support depth curves common to both surveys. A "Joins" note has been added to the smooth sheet to indicate the successful completion of the junctions.

M. COMPARISON WITH PRIOR SURVEYS

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

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-1602	1844	1:40,000	Valdez
H-2056	1890	1:40,000	Valdez

Prior surveys H-1602 and H-2056 were conducted using leadlines, and visual positioning. H-1602 provides no source data on the current chart common to the survey area and has been superseded by survey work conducted from 1890 to 1921. Comparison with H-2056 was made using a digital copy. The registration and legibility of this prior work to the present survey was satisfactory.

The preponderance of charted soundings originate with H-2056. Differences in depths generally range from 0-2 fathoms with the present survey. There appears to be no consistent trend indicating a shoal or deep bias. However, there were a few depths from the prior survey both shoaler and/or deeper in excess of ten fathoms. The evaluator feels these differences are likely the result of erroneous leadline depths and/or positional errors. Smaller changes 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 prior survey.

A prior 10 foot sounding, currently charted as 1¼ fathom, at latitude 58/37/20.5N, longitude 134/56/57W, originates from H-2056 and was investigated using shallow water multibeam. Present survey depths were found to range from 27-48 fathoms with no indication of shoaling. The evaluator recommends superseding the charted depth and charting this area based on the present survey findings. Additional information is found in the hydrographer's report, section N.

Survey H-10862 is adequate to supersede the prior survey within the common area.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-3985WD	1911	1:20,000	Valdez
H-4202WD	1921	1:40,000	Valdez
H-4202WD Add Wk	1922	1:40,000	Valdez

These prior surveys were conducted using wire drag techniques and leadlines. H-4202WD and Add Wk provide no sounding data on the current chart. However, in combination with H-3985WD, these surveys are the source for the charted green tint. Comparison with H-3985WD was made using a digital copy. The registration and legibility of this prior work to the present survey was marginal.

The wire-drag surveys listed above cover the entire area of the present survey. One sounding originating from H-3985WD was identified on the chart common to the survey area. A 48 foot sounding (8 FM) charted at latitude 58/35/39N, longitude 135/01/19W, was investigated with shallow water multibeam. Depths of 2.5 to 7.3 fathoms were found on the present survey and should supersede the prior wire drag charted sounding.

Remaining areas of the prior work reflect wire drag sweeps set to specific depths with no associated sounding information. The present survey is adequate to supersede the wire drag surveys within the common area.

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

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned for investigation within the survey area. However, a submerged wreck

in the vicinity of Vanderbilt Reef was investigated and has been adequately addressed in the hydrographer's report, section M.

O. COMPARISON WITH CHART

Survey H-10862 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
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 N. No additional discussion is required.

The charted green tint represents wire-drag areas from surveys conducted from 1911 to 1922. The evaluator recommends removing the charted green tint based on more modern data acquisition techniques.

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 H-10862 adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Two dangers to navigation were identified during survey operations. These dangers were reported to the USCG, NIMA, N/CS261, and N/CS 34 on June 13, 1998. There were no additional dangers to navigation found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10862 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.) 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.) When sounding discrepancies and displacements of depth curves occur between junctional areas accomplished by different vessels, sources of errors must be resolved before leaving the survey area. An adequate junction was effected with surveys H-10861 and H-10862 after the rejection of several soundings and rescanning the fathograms. Refer to the Hydrographic Manual sections 4.3.2 and 4.6.2.

3.) A junctional holiday with survey H-10866 exists from longitude 134/59/45W to longitude 135/00/30W along latitude 58/35/00N.

Two areas devoid of sounding information are noted within the survey limits: latitude 58/36/40.61N, longitude 135/02/48.98W (300x400 meter area) and latitude 58/35/49.63N, longitude 135/00/45W (200x800 meter area). These areas were not surveyed and are located north and east of Vanderbilt Reef in depths that range from 80-175 fathoms.

Some anomalous soundings were acquired during this survey. They originate from the poor performance of the echo sounder on steep slopes, which were surveyed at excessive vessel speed. The hydrographer attempted in many cases to correct the problem by editing the raw sounding data, however, the quality of the echo sounder trace is so poor in some areas that the edits are likely based on judgement rather than quantifiable data. Office review of the problem has determined that, with the exception of obviously erroneous depths, further editing is not reasonable since no correction can be taken to improve the quality of the trace. The judgement of the hydrographer has been accepted and generally the data was not altered during office processing. Generally, the affected depths are deep, in excess of 50 fathoms, and will have little negative effect on the quality of nautical charts if compiled at scales smaller than 1:40,000.

Q. AIDS TO NAVIGATION

There is one fixed aid to navigation within the survey area. Vanderbilt Reef Light was adequately positioned and has been discussed in the hydrographer's report, section P, and section Q, Descriptive Report Insert.

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

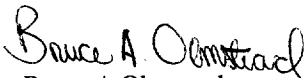
Miscellaneous information is adequately discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

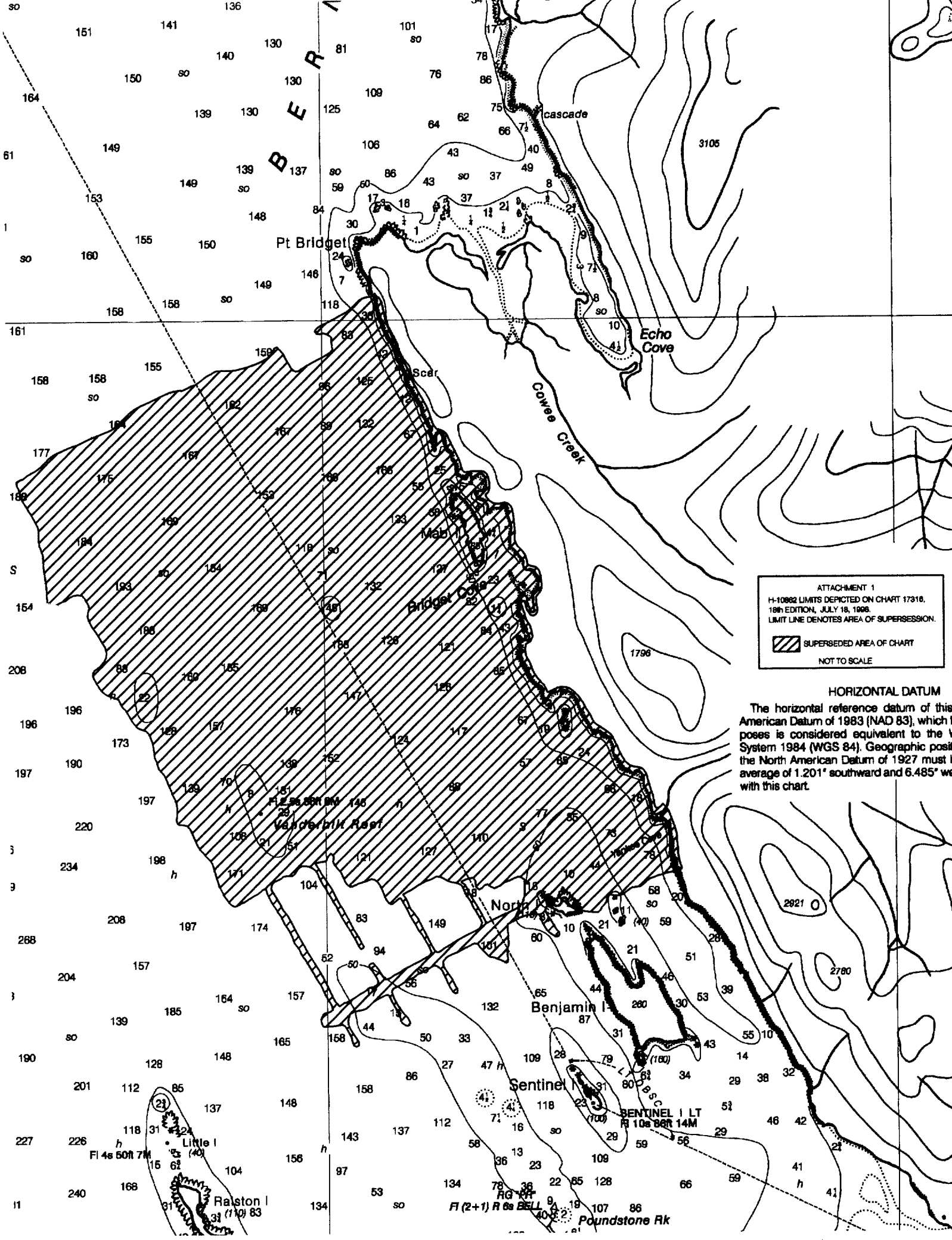
T. RECOMMENDATIONS

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


U. REFERRAL TO REPORTS

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


Bruce A Olmstead
Senior Cartographer



ATTACHMENT 1
 H-10882 LIMITS DEPICTED ON CHART 17316,
 18th EDITION, JULY 18, 1998.
 LIMIT LINE DENOTES AREA OF SUPERSESSION.

 SUPERSEDED AREA OF CHART
 NOT TO SCALE

HORIZONTAL DATUM
 The horizontal reference datum of this chart is the American Datum of 1983 (NAD 83), which for all purposes is considered equivalent to the World Geodetic System 1984 (WGS 84). Geographic positions on this chart are based on the North American Datum of 1927 must be corrected by an average of 1.201' southward and 6.485' westward with this chart.

APPROVAL SHEET
H-10862

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.

for Charles R. Davis Date: 2/1/00
Dennis J. 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.

James C. Gardner Date: 2-8-00
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Samuel P. De Bow, Jr. Date: May 8, 2000
Samuel P. De Bow Jr.,
Captain, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10862

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	1/21/30	B. Ohmsford	Full Part Before After Marine Center Approval Signed Via Drawing No. Full 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.
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