

H10810

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-10-6-98
Registry No. H-10810

LOCALITY

State Alaska
General Locality Lynn Canal
Sublocality Anyaka Island to Glacier Point
..... and Vicinity

1998

CHIEF OF PARTY

CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE JUN 10 1999

HYDROGRAPHIC TITLE SHEET

H-10810

INSTRUCTIONS - The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

FIELD NO.

RA-10-6-98

State Alaska

General locality Lynn Canal

Locality Anyaka Island to Glacier Point & Vicinity

Scale 1:10,000 Date of survey May 6, 1998 to June 19, 1998

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

Vessel RAINIER (2120), RA-4(2124), RA-5(2125), RA-6(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by CAPT A. Anderson, LT R. Fletcher, ST J. Lazar, ST D. Pattison, ST F. Lozier, ST P. McAnally, ST M. Stecher

Soundings taken by echo sounder, ~~hand lead, pot~~ DSF-6000, Kundson 320M, IDSSS Multibeam

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: B. Mihailov Automated plot by HP Design Jet 650C

Verification by B. Mihailov, G. Nelson, M. Bigelow, R. Mayor, D. Doles, R. Shipley

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

REMARKS: All times are UTC, revisions and marginal noted 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.

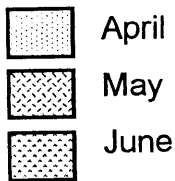
AWCIS/SURF 6/1/99 mLR

* Change 1 dated March 30, 1998

PROGRESS SKETCH

OPR-0340-RA
Lynn Canal, Alaska
April - June 1998
Capt. A. D. Anderson, NOAA
Commanding

Chart 17317

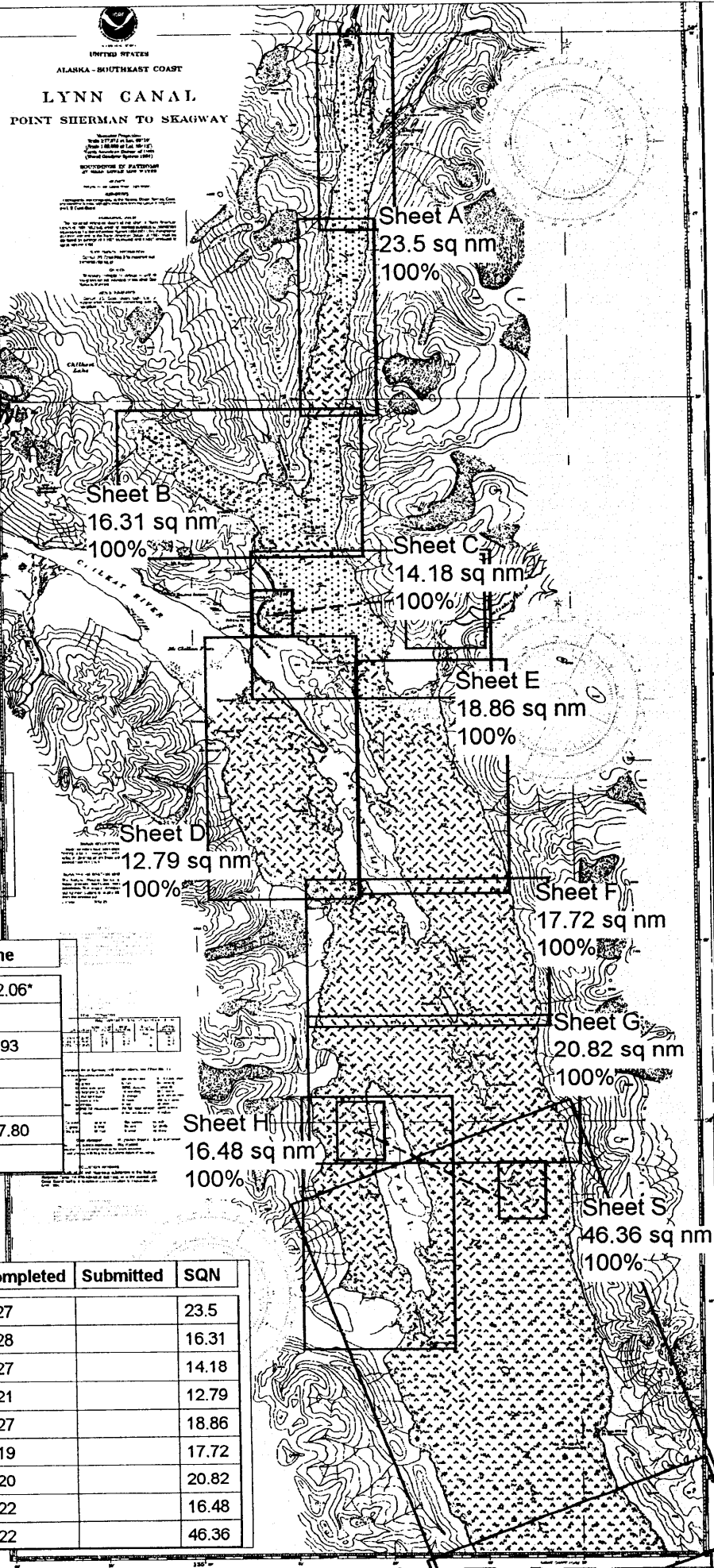


Downtime_Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	0	0	0
Electronic -Hr	1	0	0

Accomplished	April	May	June
LNM Hydro	745.57*	1787.8*	892.06*
LNM SSS	0	0	0
SQ NM	43.89	98.20	44.93
AWOIS Invest.	0	16	7
Other Invest.	0	2	0
LNM Multibeam	59.7	395.3	287.80
Days at Sea	15	25	13

* Does not include SWMB

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQN
A	H-10806	4/29	100	5/27		23.5
B	H-10736	4/22	100	5/28		16.31
C	H-10808	4/24	100	5/27		14.18
D	H-10811	5/11	100	6/21		12.79
E	H-10807	4/28	100	5/27		18.86
F	H-10810	5/6	100	6/19		17.72
G	H-10812	5/12	100	6/20		20.82
H	H-10815	5/21	100	6/22		16.48
S	H-10816	5/28	100	6/22		46.36



Descriptive Report to Accompany Hydrographic Survey H-10810

Field Number RA-10-06-98

Scale 1:10,000

May 1998

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

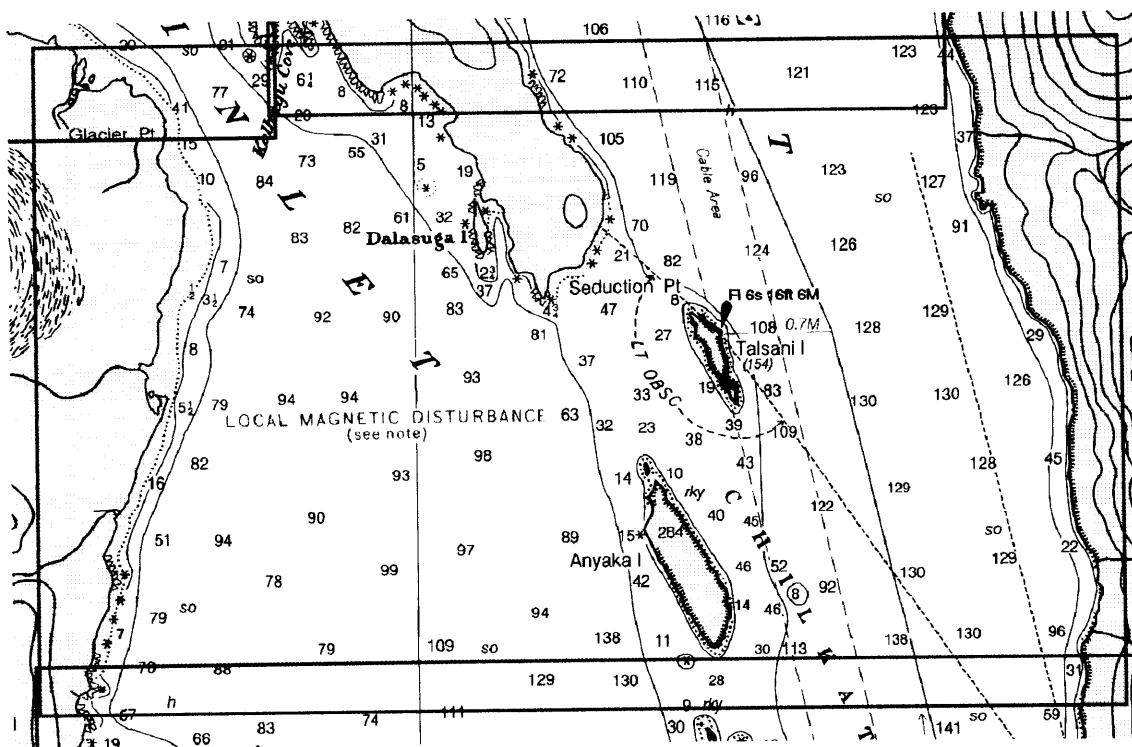
A. PROJECT ✓

This basic hydrographic survey was completed in Lynn Canal, Alaska as specified by Project Instructions OPR-0340-RA dated March 5, 1998 and change #1 dated March 30, 1998. Survey H-10810 corresponds to sheet F as defined in the sheet layout. This survey will provide data to supersede surveys performed in 1890-1905, 1921, and 1922. 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.

Alaska State Ferry Vessels and large cruise ships routinely travel through the survey area. The deepest draft vessel observed in the survey area was a luxury cruise ship with a length of over 800 ft, an approximate draft of 35-40 ft, and a complement of over 2000 passengers. The vessel was sighted east of Talsani and Anyaka Islands.

B. AREA SURVEYED See Encl Rpt., Section B

The survey area ^{includes} is offshore Anyaka Island to Glacier Point, Alaska ^{and vicinity}. The survey's northern limit is latitude $59^{\circ} 06' 48''$ N. The survey's southern limit is $59^{\circ} 02' 43''$ N, the western limit is $137^{\circ} 24' 12''$ W and the eastern limit is $137^{\circ} 17' 36''$ W. The survey limits are shown below on a detail of Chart 17317: *



* Southern limit is generally $59^{\circ} 02' 39''$ N. Eastern and western limits are the shorelines along Chilkat and Chilkoot Inlets.

Data acquisition was conducted from May 6 to June 19, 1998 (DN 126-170).

C. SURVEY VESSELS ✓

Data were acquired by RAINIER and her survey launches (vessel numbers 2124, 2125 and 2126) as noted in the Survey Information Summary print out ~~appended~~ ^{attached} to this report. Bottom samples were collected in Hypack on survey launch 2125.

<u>VN</u>	<u>DN</u>	<u>TYPE of HYDROGRAPHY</u>
2120	126	Ship IDSSS
2120	128	Ship IDSSS
2120	132	Ship IDSSS
2120	133	Ship IDSSS, XL
2124	141	SPLITS, XL
2125	128	SPLITS
2125	131	MS, S/L
2125	132	S/L, DP, MS
2125	133	S/L, SPLITS, BS
2125	146	S/L, DP, DEV
2125	170	DEV, SPLITS
2126	128	MS
2126	130	MS
2126	131	S/L, DP, MS, SPLITS
2126	133	S/L, MS, SPLITS, DP
2126	139	SPLITS
2126	145	XL, SPLITS

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

Single beam echosounder data were acquired using HYPACK version 7.1a and processed using Hydrographic Processing System (HPS). Swath data collected by the RAINIER were acquired and processed using Intermediate Depth Swath Survey System (IDSSS) and Hydrochart II (Seabeam Inc.) programs. 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 4.5 format.

A complete listing of all programs used to acquire and process data is included in Appendix VI. *

E. SONAR EQUIPMENT ✓

No Side Scan Sonar equipment was used on this survey. - ~~concur~~

F. SOUNDING EQUIPMENT ✓

Two 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 Singlebeam (VN 2124, 2125, 2126):

* Filed with the Hydrographic records

The singlebeam 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. Serial numbers are included in the Separates. *Singlebeam launches were used to collect hydrography in areas that were considered too hazardous or too shallow for shipboard IDSSS coverage, generally areas less than 150 meters of depth. In addition, singlebeam launches were used to perform all shoreline verification.

2. Shipboard Intermediate Depth Multibeam (IDSSS) (VN 2120): ✓

The IDSSS data acquisition system (DAS) consists of a Digital Equipment Corporation's (DEC) VAX Station 4000-90 computer system interfaced with a Seabeam Instruments Inc, for use in acquiring full-bottom coverage in navigable areas deeper than 150 meters. Hydrochart II sonar system, Datawell heave-roll-pitch sensor (HIPPY) is a multibeam sonar system that uses two transducer arrays (at 36 kHz) to produce an athwartship swath of bathymetric data approximately 2.5 times the water depth. The DEC VAX Station 4000-90 computer collected input from the Hydrochart II, HIPPY, gyrocompass, and the navigation system. It also provided guidance to the helmsman and plotted a near real time contour map. The DAS consisted of the following equipment:

DAS EQUIPMENT

Hydrochart II Sonar System
DEC VAX Station 4000-90 (DAS)
Sperry MK 227 Gyrocompass
ZETA 24" Plotter

DEC Server DSRVW-7C
TTi 8212 Tape Drive
DATAWELL Hippy
DEC monitor

The ship speed was reduced to provide full ensonification of the sea floor and provide a minimum of 4 pings per plotable unit area (PUA). A PUA of 50 meters was used during processing of the Hydrochart II data. The DEC VAX Station 4000-90 computer was used to process the data and create corrected merge files and selected sounding files which were exported and combined with single-beam data in HPS and in MapInfo.

Explanatory Notes about Survey Depth Discrepancies in Steep and Deep Areas: See Eval Rpt, Section P

Note 1: Discrepancies between the Knudsen and DSF-6000N echosounders can be noted in deep areas with extremely steep slopes, with DSF-6000N soundings usually being shoaler than Knudsen soundings. Inherent differences between the two measurement systems such as beam width, frequency, power output, receiver sensitivity, bottom tracking functions, and timing latency are greatly exaggerated in such areas, and consequently, differing depths between the two systems can be expected. Due to the extremely steep slopes and deepness of these areas, such differences are not significant to navigation and it is recommended that the shoaler of the soundings be charted. → *concur with clarification*

Note 2: The automated bottom tracking function of either singlebeam echosounder can begin following a relatively strong side lobe return and lose track of the weaker main beam return. Therefore, in steep areas, even when using a single, exclusive echosounder system, lines run in the off-shore direction can be shoaler than lines run in the in-shore direction. This is not significant to navigation as the difference is in the conservative direction and occurs in deep water and it is again recommended that the shoaler of the soundings be charted. *Concur with clarification*

Note 3: It should be noted that throughout the 1998 Field Season, Rainier's Intermediate Depth Swath System (IDSSS) tended to compare well with the Knudsen in steep areas of overlapping coverage. All echosounding systems compared extremely well in flat areas and in areas with moderate slope. *Concur*

* Filed with the Hydrographic records.

G. CORRECTIONS TO ECHO SOUNDINGS

Five sound velocity casts were applied to the survey data as shown in the appended Survey Information Summary report. The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated January 27, 1998, and (S/N 2543), calibrated January 10, 1998 and (S/N 2477), calibrated February 6, 1998. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.3 (1997), in accordance with Field Procedures Manual (FPM) section 2.4.3. Printouts of the sound velocity profile, data, and correctors used in field processing are included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections". The following velocity casts supplied correctors for singlebeam and IDSSS soundings for this survey:

DN	Time (UTC)	Position	HPS	
			Table No.	Table Depth (m)
117	1738	59-18'36" N 135-22'42" W	NA	551.5 - off sheet
128	1909	59-02'42" N 135-18'12" W	12	281.3
132	1637	59-02'30" N 135-17'48" W	13	277.5
139	1707	59-00'15" N 135-16'43" W	5	311.3 - offsheet
144	1642	59-00'17" N 135-16'46" W	14	286.3 - offsheet
170	1743	58-52'55" N 135-12'12" W	15	330.4 - off sheet

Static transducer depths and offsets for launches 2124, 2125, and 2126 were measured on March 26, 1998 in Port Angeles, Washington using FPM Fig 2.2. The static draft and offsets for RAINIER, 2120, were determined in April 1998 while in dry dock in Seattle, Washington.

Settlement and squat values for launch 2124 were last measured on June 11, 1998 in Shakan Strait, AK. } Applied to
 Settlement and squat values for launch 2125 were last measured on June 21, 1998 in Chilkat Inlet, AK. } final data
 Settlement and squat values for launch 2126 were last measured on June 10, 1998 in Shakan Strait, AK. }
 Settlement and squat values for the RAINIER were last measured on September 21, 1997 in Kings Bay, AK.

Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2, using FPM Fig. 2.3. All offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 4-6 correspond to the last digit of the vessel number. The offset tables are included with project data for OPR-O340-RA-98. The launches are not equipped with heave, roll and pitch sensors.

The Coastal and Estuarine Oceanography Branch (N/OES334) through N/CS31 provided predicted tides for the project on diskette for the Juneau, Alaska reference station (945-2210). HPS listings of the data used in generating tidal correctors are included in Appendix V* of this report. Tidal correctors as provided in the project instructions for H-10810 are shown on the appended Survey Information Summary report.

Skagway, Alaska (945-2400) and Juneau, Alaska (945-2210) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed Sutron 8200 tide gages at Berners Bay (945-2346) on April 20, 1998, Tiayasanka Harbor (945-2434) on April 21, 1998, and Chilkat Inlet (945-2421) on May 10, 1998.

Refer to the Field Tide Notes and supporting data in Appendix V* for individual gauge performance and level closure information. This information was forwarded to N/OES212 on July 20, 1998 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 on July 18, 1998 in accordance with FPM 4.2.3. A tide note for survey H-10810, dated Feb 16, 1999 is attached to this report.

* Filed with the Hydrographic records.

H. CONTROL STATIONS ✓ See Eval Rpt, section H.

The horizontal datum for this project is NAD 83. Station TAIYA, recovered on April 21, 1998 was used to verify and establish local geodetic control for this survey. See the OPR-0340-RA-98 Horizontal Control Report for more information. *The control stations used for this survey are listed in this report.*

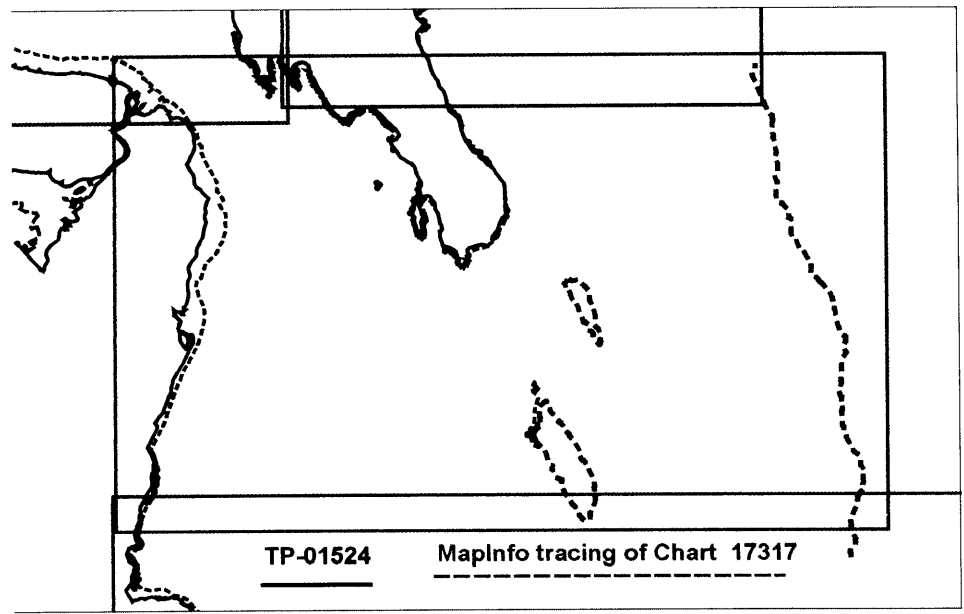
I. HYDROGRAPHIC POSITION CONTROL See Eval Rpt., section I.

All soundings were positioned using differential GPS. Primary hydrographic control was based on the USCG beacon located at Point Gustavus. A VHF differential reference station at TAIYA, repeated on a second VHF frequency by the ship, was used when possible.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 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. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. Periodic comparisons and occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-0340-RA-98.

J. SHORELINE See Eval. Report, section J.

The shoreline supplied were raster images of TP-01524 and CRS-00198. TP-01524 was digitized at the Pacific Hydrographic Branch in MapInfo format for use as source shoreline and for importing into Hypack for field verification. In areas not covered by TP-01524, CRS-00198 was available but of such poor quality that it was not used. In these areas the charted shoreline from chart 17317 was traced in MapInfo for importing into Hypack for field verification. Refer to the graphic below for the general coverage area of the sources used for field verification. *shoreline shown on the smooth sheet originates from digitized files of TP-01524, shown in black. shoreline shown in brown*



originates from CRS-00198 and chart 17317, 18th Ed., June 14, 1997 and is shown on the smooth sheet for orientation purposes only.

It should be noted that a prior edition of chart 17317 was inadvertently used to create the MapInfo tracing instead of the current 18th edition. *during ship processing. Chart 17317, Ed. 18 was used during office processing.*

Limited shoreline verification was conducted in accordance with the Project Instructions and FPM. For this survey, the NALL (Navigable Area Limit Line) was defined by the limit of safe navigation of a survey launch during a period of extreme low (negative) tide. The NALL runs at a distance of 5-50 meters offshore of the apparent low water line. Depths along the NALL are generally 2-15 m MLLW. Features seen off-shore of the NALL were positioned with the launch's DGPS by taking Detached Positions. Features seen inshore of the NALL were not positioned.

Shoreline manuscript and field features were compared to an enlargement of a chart 17317, 18th edition, 6/14/97. There was general agreement between the charted and manuscript shoreline and what the hydrographer found on this survey. Discrepancies between charted and field shoreline should thus be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot provided to PHB. Handwritten notes and features shown on the accompanying SHORELINE NOTES plot are the hydrographer's representation of the features seen in-shore of the NALL while slowly transiting along the shore, and are intended to aid chart compilation. *Shoreline verification data was analyzed during office processing and shown on the Smooth Sheet as warranted.*

The following is a list of all Detached Positions taken on new features. It is recommended that they be added to the chart: *Concur*

FIX_NUMBER	REMARK (with raw depth in meters)	POSITION Of DP	DEPTH (m) (corrected with predicted tides)	NOTES	Smooth Sheet
52046 ✓	Rock, new rng 3m brg 280M (3.5)m 52046	59-06-38.8 N 135-21-34.6 W	-3.0		ledge
52080 ✓	Rock, new rng 3m brg 090M (1.5)m 52080	59-06-25.4 N 135-20-53.1 W	-1.0		ledge
52096 ✓	Rock, new rng 3m brg 090M 0.5m 52096	59-06-08.7 N 135-20-24.5 W	1.0		ledge
53884 ✓	Rock, new rng 1m brg 120M (2)m 53884	59-04-53.6 N 135-16-39.3 W	-0.7	53884-53886 refer to the same rock. Rock is listed in Danger to Nav. letter 7-27-98	reef (2)
53885 ✓	Rock, new rng 1m brg 290M (2)m 53885	59-04-52.2 N 135-16-38.4 W	-0.7		
53886 ✓	Rock, new rng 1m brg 060M (2)m 53886	59-04-52.8 N 135-16-39.5 W	-0.7		
64641 ✓	Rock, new rng 3m brg 030M 0.5m 64641	59-05-24.5 N 135-13-12.6 W	-3.8		* (12)

The following is a list of all Detached Positions taken on features that were verified to be correctly shown on the T-sheet shoreline manuscript. It is recommended that their current charting depictions be retained: *Concur*

FIX_NUMBER	REMARK (with raw depth in meters)	POSITION Of DP	DEPTH (m) (corrected with predicted tides)	NOTES	Smooth Sheet
52036 ✓	Rock, T-sheet rng 3m brg 320M (5)m 52036	59-06-22.9 N 135-21-40.5 W	-4.5	52036-52037 refer to the same rock	reef (5)
52037 ✓	Rock, T-sheet rng 3m brg 090M (5)m 52037	59-06-25.2 N 135-21-43.0 W	-4.5		
52141 ✓	Rock, T-sheet rng 3m brg 310M (4)m 52141	59-05-36.2 N 135-19-51.9 W	-3.9		reef (12)
52142 ✓	Rock, T-sheet rng 3m brg 120M (4)m 52142	59-05-39.4 N 135-19-53.5 W	-3.9	52142-52143 refer to the same rock (Also 52141)	reef (12)
52143 ✓	Rock, T-sheet rng 2m brg 150M (.5)m 52143	59-05-40.3 N 135-19-51.5 W	-0.5		

52144 ✓	Rock, T-sheet rmg 3m brg 240M (1.5)m 52144	59-05-37.9 N 135-19-50.0 W	-1.5		Refer to Ref
62638 ✓	Rock, T-sheet rmg 1m brg 155M (1)m 62638	59-03-28.6 N 135-17-26.0 W	-2.0	62638-62641 refer to the same rock	Refer (5)
62639 ✓	Rock, T-sheet rmg 1.5m brg 080M (1)m 62639	59-03-28.0 N 135-17-27.1 W	-2.0		
62641 ✓	Rock, T-sheet rmg 1m brg 330M (1)m 62641	59-03-27.4 N 135-17-26.2 W	-2.0		

The following is a list of all Detached Positions taken on features that are shown on the chart but are not shown on the T-sheet shoreline manuscript:

FIX_NUMBER	REMARK * (with raw depth in meters)	POSITION Of DP	DEPTH (m) (corrected with predicted tides)	NOTES	
62550 ✓	Rock, Chd rmg 2.5m brg 220M (1.5)m 62550	59-02-40.7 N 135-16-51.5 W	-1.6	Recommend to retain as charted	Concur

* Ref uncovering 5 ft has been transferred to smooth sheet from junction survey H-10812.

The following is a list of all features seaward of the NALL that were inadvertently not verified with a Detached Position. (Reference numbers refer to the position fix obtained nearest to the feature.)

FIX_NUMBER	Feature Type	Approx. Charted Position	Comments	Charting Recommendation
R-53031 ✓	Rock	59-06-25 N 135-21-56 W	R-53031 refers to a charted rock that is not shown on prior survey H-02057. The item was not visually sighted while performing shoreline verification or mainscheme hydrography. The shoalest depths found in the area were 9-14 fathoms. However, insufficient investigation was performed to warrant removing it from the chart. It should be noted that the rock is charted in the precise position as a "rky" note shown on prior survey H-02057. It is possible that the rock was originally charted in error.	Retain as charted <i>Do not Concur</i> <i>See Eval Rpt, Section M</i> Further investigation into the source of this rock is recommended.

K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography, except in areas of steep bathymetry. (See Section F, Sounding Equipment for details). There were a total of 22.36 nautical miles of crosslines, comprising 18% of mainscheme hydrography.

L. JUNCTIONS *See Eval Report, Section L.*

This survey junctions with the following 1998 surveys: H-10811, 1:10,000 on the northwest, H-10807, 1:10,000 on the northeast, and H-10813, 1:10,000 on the south. Soundings on these 1998 surveys were found to be in good agreement, except on the extreme northeast corner of this survey where there is a 30 meter

offset discrepancy between the contours of this survey and H-10807 due to the steep bathymetry in that area. *Concur*
 (See Section F, Sounding Equipment for details). Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

M. COMPARISON WITH PRIOR SURVEYS ✓ *See Eval Rpt., Section M*

Registry #	Scale	Date	Remarks
H-02057	1:40,000	1890 – 1905	covers entire survey
H-04202WD	1:40,000	1921	portion covering current survey is illegible
H-04226WD	1:40,000	1922	portion covering current survey is illegible

H-02057: ✓

Prior survey H-02057 provides nearly all soundings shown on the current edition of the chart (Ch 17317, 18th edition) within the survey area. Consequently, the results of the comparison with H-02057 are addressed in Section, O., Comparison with the Chart.

H-04202WD and H-04226WD: ✓

The copies of prior surveys H-04202WD and H-04226WD that were provided were illegible and consequently not used for comparison with the present survey.

Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey.

N. ITEM INVESTIGATIONS ✓

No AWOIS items were assigned on this survey, however several shoal soundings were found and developed and are addressed in Section O, Comparison with the Chart. *Concur*

O. COMPARISON WITH THE CHART *See Eval Report, Section O.*

Chart 17317, 1:77,812, 18th edition, 6/14/97 is the largest scale chart covering the survey area.

It was noted that the current survey shows a large area in Chilkat Inlet to be consistently deeper than charted soundings, indicating localized subsidence. Current survey depths in the area range from 100-115 fathoms. The charted depths range from 89-99 fathoms and originate from H-02057. Full bottom coverage was obtained in this area of the survey by Rainier IDSSS. The area is west-northwest of Anyaka Island and is defined by the following coordinates:

	<i>Latitude</i>	<i>Longitude</i>
NW	59-03-49 N	135-20-11 W
NE	59-03-56 N	135-19-12 W
SE	59-02-48 N	135-17-46 W
SW	59-03-14 N	135-20-21 W

The chart shows a 10 fathom sounding at Lat 59-03-49 N, Long 135-16-57 W, near the north end of Anyaka Island, where the current survey shows depths of 35-37 fathoms. (The 10 fathom sounding originates from H-02057.) The current survey covered this area with a singlebeam echosounder using 50 meter line spacing. It was discovered after the ship had left the survey area that the 10 fathoms sounding was not further developed for disapproval. Consequently, it is recommended to retain the 10 fathom sounding on the chart. *Do not concur See Eval Rpt Section M.*

In other areas, soundings from the current survey generally agreed well with the chart. *Concur*

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

reduction to final vertical datum.

The charted cable area was not addressed by this survey

Dangers to Navigation

Four shoal depths and an uncharted rock were reported to the Seventeenth Coast Guard District on July 27, 1998 as dangers to navigation. Copies of the correspondence can be found in Appendix I of this report.

Feature Type	Fix Number	Latitude (N)	Longitude (W)	Depth (fm)	Development	Smooth sheet
Shoal depth	54393 ✓	59-03-02.094	135-15-35.837	7	10m line spaced Echosounder splits	7.2 fms Chart 7 ₁
Shoal depth	54334 ✓	59-03-48.945	135-17-31.152	4.5	10m line spaced Echosounder splits	4.7 fms Chart 4 ₄
Shoal depth	54214 ✓	59-05-50.624	135-19-58.098	0.5	10m line spaced Echosounder splits	0.6 fms Chart 0 ₃
Shoal depth	53935 ✓	59-06-04.023	135-20-41.069	4.25	10m line spaced Echosounder splits	4.3 fms Chart 4 ₂
Rock	53886 ✓	59-04-52.838	135-16-39.527		Shoreline Verification DP- see section J.	reef (2) Chart rock

P. ADEQUACY OF SURVEY ✓ See Eval Rpt., Section P.

Survey H-10810 is complete and adequate to supersede all prior soundings and features in their common areas, except the 10 fathom sounding charted at Lat 59-03-49 N, Long 135-16-57 W noted in Section O., Comparison with the Chart. *Concur with clarification.*

Q. AIDS TO NAVIGATION ✓

One navigational aid exists within the survey limits. Talsani Island Light, Coast Guard 1998 light list number 23890, is characterized as Fl W 6s. The location of the aid adequately serves the apparent purpose for which it was established, however the light characteristics were not confirmed. See Q insert for details, *attached to this report.*

R. STATISTICS ✓

Refer to the Survey Information Summary attached to this report.

S. MISCELLANEOUS ✓

Twenty bottom samples were collected and sent to the Smithsonian in accordance with Project Instructions. No unusual tidal currents were found during this survey. However, charted magnetic variations of up to 20 degrees were confirmed.

T. RECOMMENDATIONS *See Eval Rpt, section T*

The 0.5 fathom MLLW (predicted tides) shoal depth identified in the Danger to Navigation Letter dated July 27, 1998 should be further reviewed after the application of smooth tides to determine if it should be charted as a depth or a rock awash. *0.6 Fathom MLLW with approved tides. Chart 03*

It is recommended that the 10 fathom sounding charted at Lat 59-03-49 N, Long 135-16-57 W be considered for further investigation. *Do not concur (See Eval Rpt, Section M.)*

U. 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-P125-RA Horizontal Control Report	June 25, 1998	N/CS34
Project related data for OPR-P125-RA	Incremental	N/CS34

Respectfully Submitted,



Danielle Pattison
Senior Survey Technician

Reviewed by,



Eric J. Sipos
Lieutenant (JG), NOAA

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer

List of Horizontal Control Stations ✓

NAME	STATE	TYPE	LATITUDE	LONGITUDE	SITEID	DEC_LAT	DEC_LON
ACE	AK	DGPS Flyaway	58 58.2659N	135 13.2729W	n/a	58.97109833	135.22121500
ANNETTE ISLAND	AK	USCG Beacon	55 04.1000N	131 36.0000W	889	55.06833333	131.60000000
GUSTAVUS	AK	USCG Beacon	58 25.1000N	135 41.8000W	892	58.41833333	135.69666667
LETNIKOF	AK	DGPS Flyaway	59 10.4206N	135 24.0383W	n/a	59.17367667	135.40063833
TAI	AK	DGPS Flyaway	59 17.2739N	135 24.1058W	n/a	59.28789833	135.40176333

Section Q: Descriptive Report Insert ✓

Name of Aid: Talsani Island Light
Light List #: 23890

Method of Positioning GPS: DGPS: Other: _____

Positioning Information

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	59-04.7	135-16.3
Survey Pos.	59-04-42.412	135-16-25.410 ✓

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	48757.6	147953.5
Survey Pos.	48639.5	147966.3

Difference between Charted and Surveyed Position: Distance: 119 meters
(Bearing from Surveyed to Charted Position) Bearing: 96 deg T

Characteristics Flashing White, 6 seconds
Do characteristics match Light List? Yes No
If no, what are the characteristics? _____

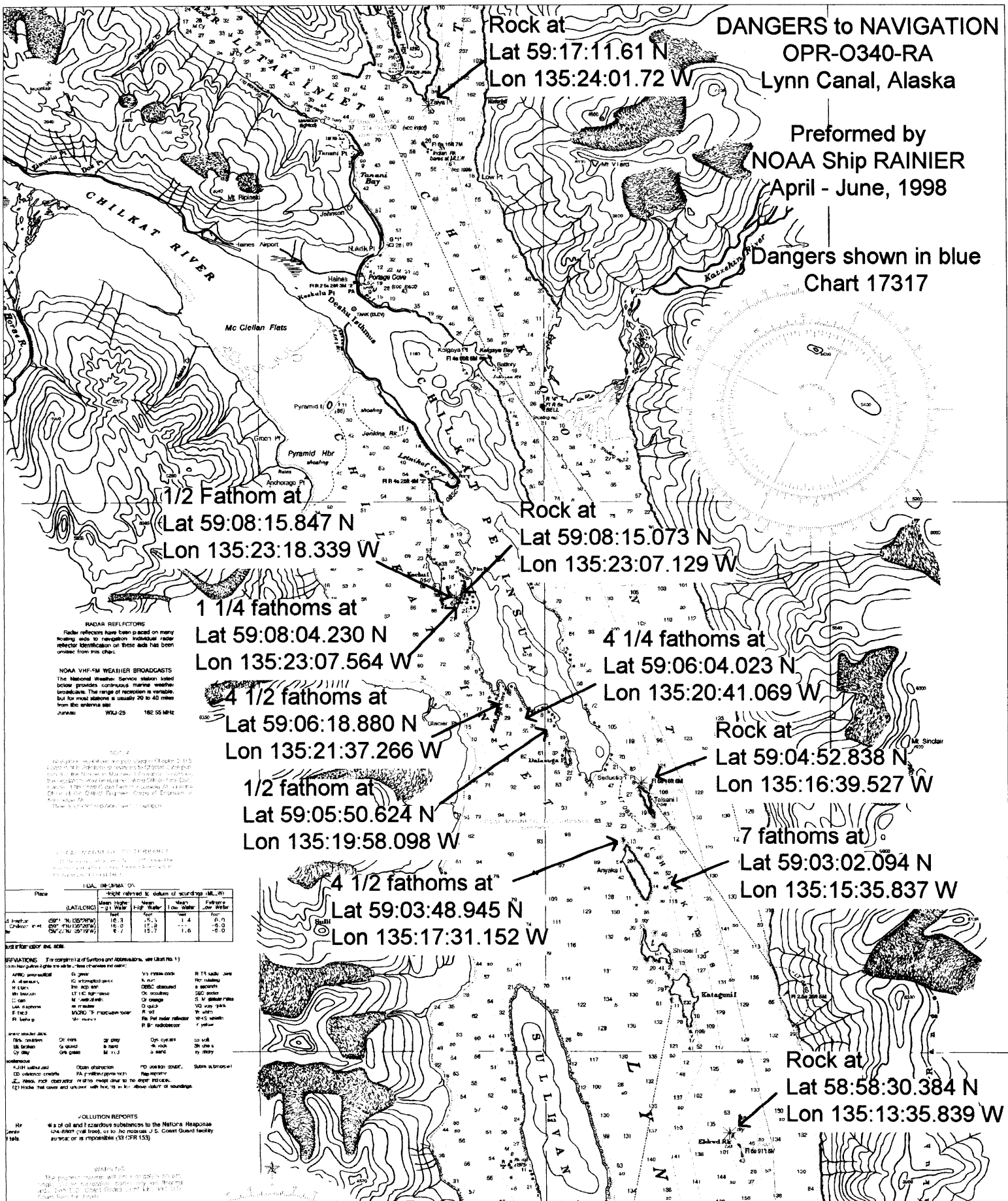
Does the aid adequately serve its apparent purpose? Yes No
If no, why not? _____

New/Uncharted Aids (if information is known or easily obtained)
Date Est: _____
Maintained By: Coast Guard Private? Yes No
Is aid seasonally maintained? Yes No
Frequency of Maintenance: _____

Apparent Purpose: _____

Other Information: Published position 59-04.7N; 135-16.4 W

ADVANCE INFORMATION



Rock at
Lat 59:17:11.61 N
Lon 135:24:01.72 W
DANGERS to NAVIGATION
OPR-0340-RA
Lynn Canal, Alaska

Preformed by
NOAA Ship RAINIER
April - June, 1998

Dangers shown in blue
Chart 17317

1/2 Fathom at
Lat 59:08:15.847 N
Lon 135:23:18.339 W

Rock at
Lat 59:08:15.073 N
Lon 135:23:07.129 W

1 1/4 fathoms at
Lat 59:08:04.230 N
Lon 135:23:07.564 W

4 1/4 fathoms at
Lat 59:06:04.023 N
Lon 135:20:41.069 W

4 1/2 fathoms at
Lat 59:06:18.880 N
Lon 135:21:37.266 W

Rock at
Lat 59:04:52.838 N
Lon 135:16:39.527 W

1/2 fathom at
Lat 59:05:50.624 N
Lon 135:19:58.098 W

7 fathoms at
Lat 59:03:02.094 N
Lon 135:15:35.837 W

4 1/2 fathoms at
Lat 59:03:48.945 N
Lon 135:17:31.152 W

Rock at
Lat 58:58:30.384 N
Lon 135:13:35.839 W

RADAR REFLECTIONS
 Radar reflections have been based on many sounding aids to navigation. Individual radar reflector identification on these aids has been omitted from this chart.

NOAA VHF-FM WEATHER BROADCASTS
 The National Weather Service station listed below provides continuous marine weather broadcasts. The range of reception is variable, but for most stations is usually 20 to 40 miles from the antenna site.

NOAA VHF-FM WEATHER BROADCASTS

The National Weather Service station listed below provides continuous marine weather broadcasts. The range of reception is variable, but for most stations is usually 20 to 40 miles from the antenna site.

NOAA VHF-FM WEATHER BROADCASTS

Place	VHF-FM Channel (LAT/LONG)	Signal referred to datum of soundings (MLLWS)			
		Mean High Water	Mean Low Water	Mean Low Water	Extreme Low Water
4 Harbor	68.1 N 155.0 W	6.3	5.3	4.4	3.0
Chukchi	68.1 N 155.0 W	6.3	5.3	4.4	3.0
Chukchi	68.1 N 155.0 W	6.3	5.3	4.4	3.0

ABBREVIATIONS For complete list of Symbols and Abbreviations see Chart No. 13
 (1) See Navigation Aids section for details of symbols and abbreviations.

SYMBOLS

A	Anchor	IC	Iceberg	PL	Light	RT	Rock
B	Beacon	LC	Light	RA	Radar	RW	Rock
C	Cable	LT	Light	SA	Sounding	SC	Shoal
D	Dredge	LT	Light	SB	Sounding	SD	Shoal
E	Entrance	LT	Light	SC	Sounding	SE	Shoal
F	Fathoms	LT	Light	SD	Sounding	SE	Shoal
G	Ground	LT	Light	SE	Sounding	SE	Shoal
H	Harbor	LT	Light	SE	Sounding	SE	Shoal
I	Island	LT	Light	SE	Sounding	SE	Shoal
J	Jetty	LT	Light	SE	Sounding	SE	Shoal
K	Keel	LT	Light	SE	Sounding	SE	Shoal
L	Light	LT	Light	SE	Sounding	SE	Shoal
M	Mine	LT	Light	SE	Sounding	SE	Shoal
N	Navigational	LT	Light	SE	Sounding	SE	Shoal
O	Obstruction	LT	Light	SE	Sounding	SE	Shoal
P	Pier	LT	Light	SE	Sounding	SE </tr	

COLLISION REPORTS
 Reports of collisions between vessels are forwarded to the National Maritime Collision Reporting System (NMCRS) by the Coast Guard. Reports should be filed with the Coast Guard as soon as possible after the collision.

APPROVAL SHEET

for

H-10810

RA-10-6-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, ~~Fourth~~ ^{Fifth} Edition; 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

Survey Information Summary

Project: OPR-0340-98 **Project Name:** LYNN CANAL
Instructions Dated: 3/5/98 **Project Change Info:** **Change #** 1 **Dated** 3/30/98

Sheet Letter: F **Registry Number:** H-10810
Sheet Number: RA-10-06-98

Survey Title: Anyaka Island to Glacier Point
Data Acquisition Dates: **From:** 06-May-98 126 **To:** 19-Jun-98 170

Vessel Usage Summary

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

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
10	20	118	250.5	59/05/59 135/16/28	
11	20	125	287.8	59/06/42 135/16/19	
12	20	128	281.3	59/02/42 135/18/12	
13	20	132	277.5	59/02/30 135/17/48	
5	20	139	311.3	59/00/15 135/16/43	
14	20	144	286.3	59/00/17 135/16/46	
6	20	148	363.7	58/56/24 135/14/39	
8	20	166	374.1	58/48/24 135/09/36	
15	20	170	330.4	58/52/55 135/12/12	

Tide Zone Information

Tide Gage Information

Statistics Summary

Type	Total:	Percent XL: 18.0%
BS	20	SQNM: 17.72
DEV	14.11	
DP	16	
MBMS	104.5	
MBXL	16.5	
MS	124.34	
S/L	19.05	
SPLIT	139.5	
XL	22.36	



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 16, 1999

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-0340-RA

HYDROGRAPHIC SHEET: H-10810

LOCALITY: Anyaka Island to Glacier Point, Alaska

TIME PERIOD: May 6 - June 19, 1998

TIDE STATION USED: 945-2400 Skagway, AK

Lat. $59^{\circ} 27.0'N$ Lon. $135^{\circ} 19.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.799 meters

TIDE STATION USED: 945-2421 Chilkat Inlet

Lat. $59^{\circ} 10.2'N$ Lon. $135^{\circ} 24.0'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.722 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEA1L, SEA2, SEA2A.

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 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. All zones within a survey sheet may not have the same order of applicable tide stations.

Thomas V. Mero 2/17/99

CHIEF, REQUIREMENTS AND ENGINEERING BRANCH

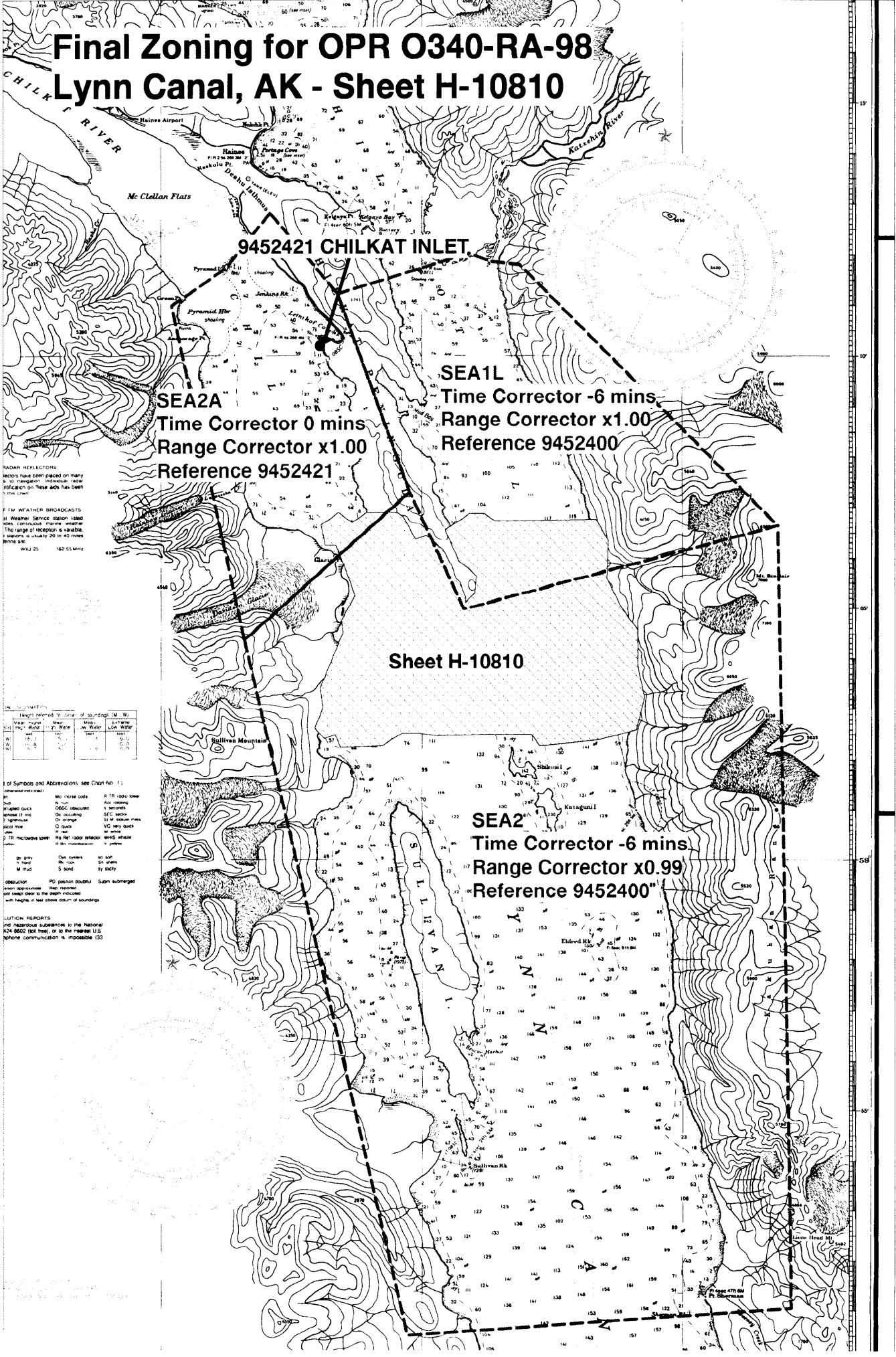


Final tide zone node point locations for OPR 0340-RA-98,
Sheet H-10810.

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 SEA1L				
-135.303335	59.200565	945-2400	-6	1.00
-135.387161	59.18722			
-135.341223	59.121611			
-135.306731	59.082928			
-135.105993	59.11054			
-135.270989	59.19686			
-135.289805	59.19791			
-135.303335	59.200565			
Zone SEA2				
-135.44689	59.072625	945-2400	-6	0.99
-135.342726	58.841529			
-135.097316	58.8506			
-135.105993	59.11054			
-135.306731	59.082928			
-135.341223	59.121611			
-135.44689	59.072625			
Zone SEA2A				
-135.430336	59.213684	945-2421	0	1.00
-135.458521	59.195675	945-2400	-6	1.00
-135.493123	59.183157			
-135.44689	59.072625			
-135.341223	59.121611			
-135.387161	59.18722			
-135.430336	59.213684			

Final Zoning for OPR O340-RA-98 Lynn Canal, AK - Sheet H-10810



9452421 CHILKAT INLET

SEA2A
Time Corrector 0 mins
Range Corrector x1.00
Reference 9452421

SEA1L
Time Corrector -6 mins
Range Corrector x1.00
Reference 9452400

SEA2
Time Corrector -6 mins
Range Corrector x0.99
Reference 9452400"

Sheet H-10810

RADAR REFLECTORS
Reflectors have been placed on many of the navigational aids. Radar reflectors on these aids have been shown.

VHF WEATHER BROADCASTS
Weather Service station issued continuous marine weather forecasts. The range of reception is variable. Stations are usually 20 to 40 miles from shore.

WUJ 25 162.55 MHz

HEIGHTS REFERRED TO DATE OF SOUNDINGS

Mean High Water	Mean Low Water	Mean Tide	Low Water	3.7 Meters
17.1	13.1	15.1	11.1	36.6
17.1	13.1	15.1	11.1	36.6
17.1	13.1	15.1	11.1	36.6

List of Symbols and Abbreviations (see Chart No. 1)

Shaded area	Shaded area	Shaded area	Shaded area
Shaded area	Shaded area	Shaded area	Shaded area
Shaded area	Shaded area	Shaded area	Shaded area
Shaded area	Shaded area	Shaded area	Shaded area

NOTATION
PD position soundings
Submerged
Sounding
Sounding
Sounding

LUTION REPORTS
and hazardous substances to the National
624-8602 (toll free), or to the nearest U.S.
where communication is impossible (3)

GEOGRAPHIC NAMES

H-10810

Name on Survey	<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">A ON CHART NO. 17317</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">B ON PREVIOUS SURVEY NO.</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">C ON U.S. QUADRANGLE MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">D FROM LOCAL INFORMATION</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">E ON LOCAL MAPS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">F P.O. GUIDE OR MAP</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">G RAND McNALLY ATLAS</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">H U.S. LIGHT LIST</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">K</div> </div>											
	ALASKA (title)	X		X								
ANYAKA ISLAND	X		X									2
CHILKAT INLET	X		X									3
CHILKAT ISLANDS	X		X									4
CHILKAT PENINSULA	X		X									5
CHILKOOT INLET	X		X									6
DALASUGA ISLAND	X		X									7
DAVIDSON GLACIER	X		X									8
GLACIER POINT	X		X									9
KALHAGU COVE	X		X									10
LYNN CANAL (title)	X		X									11
SEDUCTION POINT	X		X									12
TALSANI ISLAND	X		X									13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved:

Dennis J. Roseburg
APR 29 1999

HYDROGRAPHIC SURVEY STATISTICS

H-10810

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
DESCRIP-TION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/ SOURCE DOCUMENTS
ACCORDION FILES	1				
ENVELOPES					
VOLUMES					
CAHIERS					
BOXES					

SHORELINE DATA

SHORELINE MAPS (List):	TP-10524 /CRS-00198
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	17317, 18th Ed., June 4, 1997

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 (Multi-beam)	32.5		32.5	
VERIFICATION OF SOUNDINGS	108.0		108.0	
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION/VERIFICATION				
COMPILATION OF SMOOTH SHEET	121		121	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10.0		
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		40.0	40	
GEOGRAPHIC NAMES				
OTHER (Chart Compilation)		38	38	
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	261.50	88	349.5
Pre-processing Examination by M. Bigelow	Beginning Date 9/1/98	Ending Date 3/11/99		
Verification of Field Data by D. Doles, M. Bigelow, R. Shipley, B. Mihailov, G. Nelson	Time (Hours) 261.50	Ending Date 4/7/99		
Verification Check by B. Olmstead	Time (Hours) 11	Ending Date 4/12/99		
Evaluation and Analysis by B. Mihailov	Time (Hours) 50	Ending Date 4/6/99		
Inspection by B.A. Olmstead	Time (Hours) 8	Ending Date 5/6/99		



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

**ADVANCE
 INFORMATION**

NOAA Ship RAINIER
 July 27, 1998

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

Dear Sir:

The following dangers to navigation should be included in the Local Notice to Mariners. These features were positioned by the NOAA Ship RAINIER while conducting hydrographic surveys in Lynn Canal, Alaska. The dangers are shown graphically on the attached chartlet and affect chart 17300, 27th edition, August 14, 1993 & chart 17317, 18th edition, June 14, 1997. Positions were acquired using differential GPS and are given in the NAD 83 datum. Depths have been corrected to Mean Lower Low Water using predicted tides.

Feature Type	Depth (fm)	Latitude (N)	Longitude (W)	Position Number	Depth Meters	Survey Number
Rock		59:17:11.610	135:24:01.720	50666		H-10736
Submerged Rock	0.25	59:08:15.073	135:23:07.129	20039	0.5	H-10811
Shoal depth	0.5	59:08:15.847	135:23:18.339	45242	1.1	H-10811
Shoal depth	1.25	59:08:04.230	135:23:07.564	29176	2.3	H-10811
Shoal depth	4.5	59:06:18.880	135:21:37.266	64927	8.3	H-10811
Rock		59:04:52.838	135:16:39.527	53886		H-10810
Shoal depth	7	59:03:02.094	135:15:35.837	54393	12.9	H-10810
Shoal depth	4.5	59:03:48.945	135:17:31.152	54334	8.3	H-10810
Shoal depth	0.5	59:05:50.624	135:19:58.098	54214	0.9	H-10810
Shoal depth	4.25	59:06:04.023	135:20:41.069	53935	7.7	H-10810
Rock		58:58:30.384	135:13:35.839	41928		H-10812

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 and Danger to Navigation message RA-5-98.

Sincerely,

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

Attachment

Cc: NIMA
 PMC
 N/CS261
 N/CS34



EVALUATION REPORT

H-10810

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 an Attachment 1.

The bottom consists mainly of mud. Depths range from the Mean Lower Low Water (MLLW) line to 128 fathoms.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Single beam data for this survey was acquired using HYPACK and processed using the Hydrographic Processing System (HPS). Swath data was acquired and processed using IDSSS and Hydrochart II programs. HPS and MicroStation 95 were used for office processing.

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 is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

No Side Scan Sonar equipment was used on this survey.

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. 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, tide reductions were derived from the following tide gages; Chilkat Inlet, AK, 945-2421 and, Skagway, AK, 945-2400.

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:	-1.173 seconds	(-36.285 meters)
Longitude:	6.578 seconds	(104.785 meters)

I. HYDROGRAPHIC POSITION CONTROL

Differential GPS (DGPS) was used to control this survey. A horizontal dilution of precision (HDOP) not to exceed 3.75 was computed for survey operations. The quality of several positions exceeds 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. DGPS performance checks were conducted in the field and found adequate.

During multibeam data gathering, satellite configuration as indicated by HDOP and the number of satellites, is monitored visually on the IDSSS and Trimble displays, and data are not collected when HDOP exceeds 3.75. 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 accurate than DGPS (a maximum of 15 meters), it is an acceptable limit of accuracy for a survey of 1:10,000 scale. Data was analyzed during office processing and found to contain no significant errors.

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

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

J. SHORELINE

Shoreline shown on the smooth sheet in black originates from TP-01524 and was digitized at the Pacific Hydrographic Branch and merged in MicroStation. Shoreline shown on the smooth sheet in brown originates from CSR 00198 (1993) and Chart 17317, 18th Edition, dated June 14, 1997 and are for orientation purposes only. The shoreline data and the hydrographic data were merged in MicroStation during the compilation of the smooth sheet. The shoreline map and the results of the fieldwork as portrayed on the smooth sheet should supersede charted shoreline.

Most of the rocks depicted on the shoreline manuscript were identified in the field and many were found to be high points or extensions of newly located reefs and ledges.

Further discussions concerning shoreline noted during this survey is included in the hydrographer's report.

There were no MHW revisions on this survey

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10810 junctions with the following surveys:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10807	1998	1:10,000	Northeast
H-10811	1998	1:10,000	Northwest
H-10815	1998	1:10,000	South

The junctions with surveys H-10811 and H-10815 are complete. A "Joins" note has been added to the smooth sheet where applicable. The examination reveals good agreement between soundings and standard depth curves. A few soundings and features have been transferred from these junctional surveys to better portray the common area. A joins note has been added to the smooth sheet.

The junctional differences in the hydrographer's report with survey H-10807 are directly attributed to data collection over steep slopes. This data was further analyzed during office processing and found to contain no significant problems. An adequate junction has been effected between these contemporary surveys. A few soundings have been transferred from these junctional surveys to better portray the common area. A joins note has been added to the smooth sheet.

M. COMPARISON WITH PRIOR SURVEYS

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-2057	1890-1905	1:40,000

The above prior survey covers the entire area of the present survey. Differences in depths generally range from 1 to 5 fathoms with the present survey. A comparison of standard depth curves with the prior surveys reveal little change in configuration except where present hydrography defined new or existing shoal areas. These differences may be attributed to greater sounding coverage, improved positioning and sounding methods and relative accuracy of the data acquisition techniques. There appears to be no consistent pattern of shoaling or an increase in depths, except as follows;

An area defined in the hydrographer's report, section O, reflects the prior survey depths shoaler from 10-20 fathoms. Multi Beam sounding coverage was obtained in this area with no indication that these prior shoaler depths exist. These differences are likely attributed to poor positioning and or erroneous leadline values.

The charted rock at latitude 59/06/25N, longitude 135/21/56W originates from prior survey H-2057. This feature was generalized offshore based on ledge information shown on the 1890-1905 survey work. A ledge was found approximately 100 meters east of the charted rock.

Survey depths found near the rock ranged from 14-17 fathoms. The evaluator recommends the rock be removed from the chart and the area compiled from the present survey.

The charted ten fathom depth discussed in the hydrographer's report, section O and T, should be superseded by the present survey. The prior survey shows this depth approximately 100 meters northwest of its charted position. The present survey found similar depths within 50 meters of the prior depth.

The present survey is adequate to supersede the prior survey in the common area.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-4202WD	(1921)	1:40,000
H-4226WD	(1922)	1:40,000

The above wire-drag surveys cover the entire area of the present survey. A few charted depths originate from these surveys. However, most of the prior work reflects wire drag sweeps set to specific depths with no associated sounding information. Charted soundings originating from these prior wire drag surveys have been satisfactorily addressed and should be superseded by the present survey.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10810 was compared with the following chart:

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>
17317	18th	June 14, 1997	1:77,812

a. Hydrography

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

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 present survey work combining single beam and multibeam coverage are considered adequate to remove the charted green tint.

Survey H-10810 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Five dangers to navigation were discovered during survey operations and reported to the USCG on July 27, 1998. No additional dangers to navigation were found during office processing. A copy of the report is attached.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10810 is adequate to:

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

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

In the event that the field units submission of survey data will exceed four weeks from completion of field work, the Chief of Party will submit a written explanation for the delay indicating the anticipated transmittal date to the Chief of the appropriate processing section. Marine Center ships forward their explanation through the Marine Center Director. Field work for survey H-10810 was completed on June 19, 1998 but not received for office processing until September 1, 1998.

Some anomalous soundings were acquired during this survey. They originate from the poor performance of the echo sounder on steep slopes. The hydrographer attempted 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, which have been revised and or rejected, further editing is not reasonable since no corrective action 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.

Q. AIDS TO NAVIGATION

There is one fixed aid to navigation within the survey area. This aid was positioned and adequately serves the intended purpose. See the hydrographer's report, section Q, and the descriptive report insert (attached) for additional information.

There were no features of landmark value located and or recommended for charting.

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

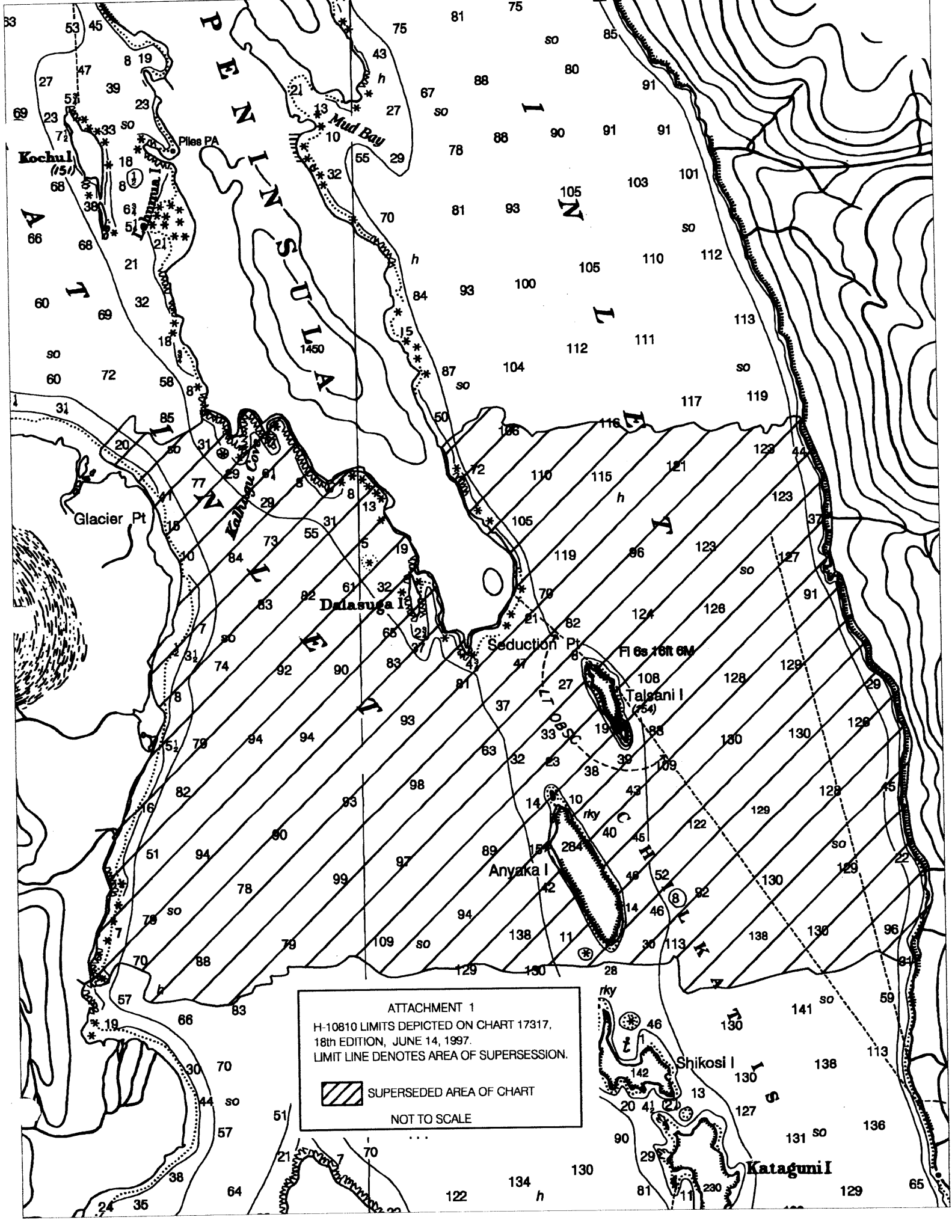
This is a good hydrographic survey. No additional work is recommended.

U. REFERRAL TO REPORTS


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



Bob Mihailov
Cartographer



ATTACHMENT 1
 H-10810 LIMITS DEPICTED ON CHART 17317,
 18th EDITION, JUNE 14, 1997.
 LIMIT LINE DENOTES AREA OF SUPERSESSON.

 SUPERSEDED AREA OF CHART

NOT TO SCALE

APPROVAL SHEET
H-10810

Initial Approvals:

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

Bruce A. Olmstead Date: 5/7/99
Bruce A. Olmstead
Senior Cartographer, Cartographic Section
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: 5-19-99
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Samuel P. De Bow Date: June 10, 1999
Samuel P. De Bow
Commander, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10810

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
17317	5/6/99	B. Mikhailov	Full Part Before After Marine Center Approval Signed Via <i>Full application</i> Drawing No. <i>of sndgs and features from SS.</i>
			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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SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED