

H10811

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

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Type of Survey ..... Hydrographic  
Field No. .... RA-10-7-98  
Registry No. .... H-10811

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LOCALITY

State ..... Alaska  
General Locality ..... Lynn Canal  
Sublocality ..... Chilkat Inlet

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1998

CHIEF OF PARTY  
CAPT Alan D. Anderson, NOAA

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LIBRARY & ARCHIVES

DATE ..... AUG 26 1999

**HYDROGRAPHIC TITLE SHEET**

H-10811

**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-10-7-98

State Alaska

General locality Lynn Canal

Locality Chilkat Inlet

Scale 1:10,000 Date of survey 5/11/98 - 6/21/98

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

Vessel RA-2(2122), 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, LT D. Baird, LTJG R. Sipos, RH M. Lathrop, ST J. Lazar, ST D. Pattison, ST W. Lin, ST F. Lozier, ST P. McAnally

Soundings taken by ~~echo sounder, beam trawl, pole~~ echo sounder, DFS-6000N, Knudsen 320M

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Shipley Automated plot by HP Design 650 Jet

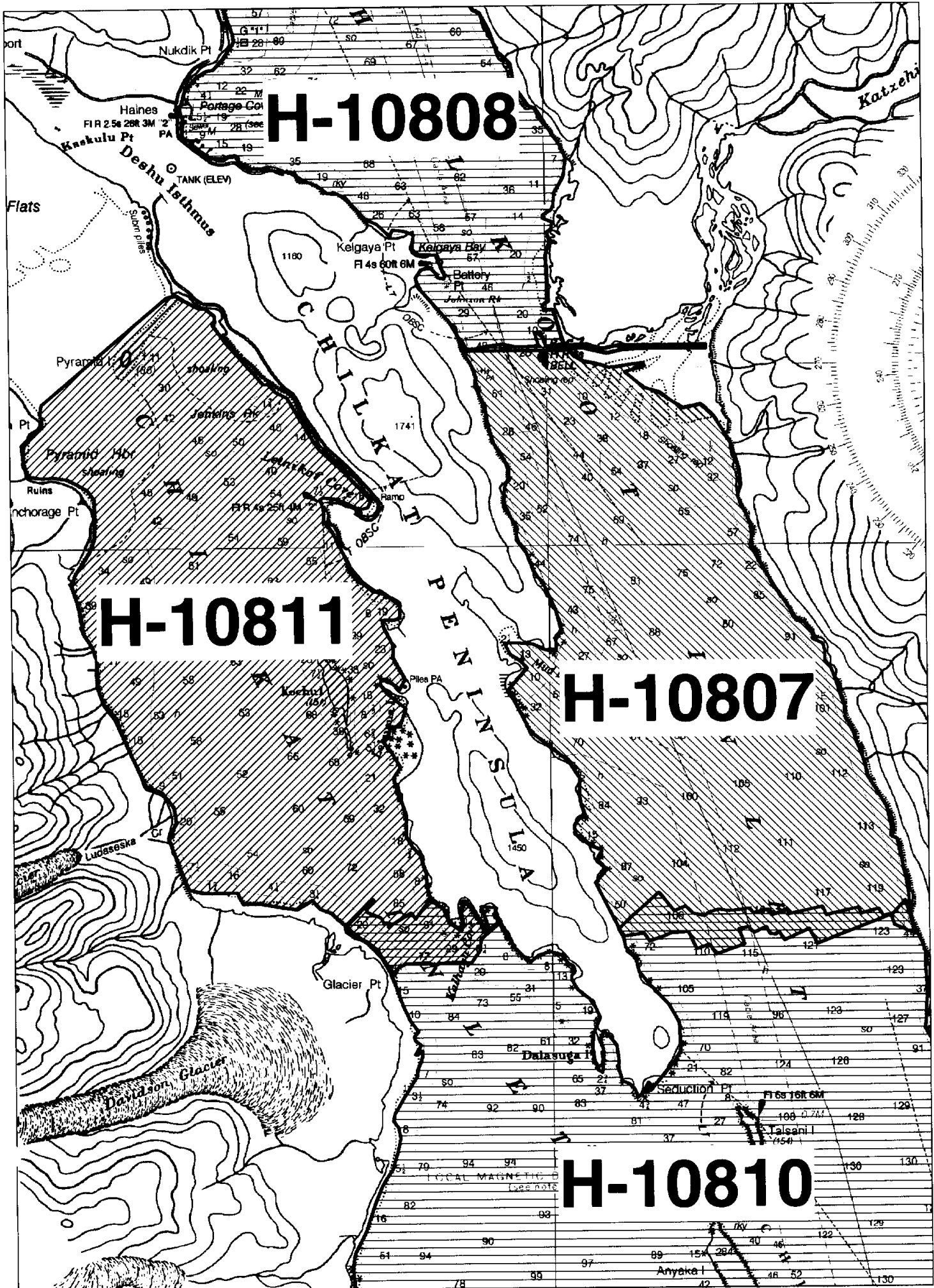
~~Processed by~~ Verification by M. Bigelow, D. Doles, R. Mayor, E. Domingo, R. Shipley

Soundings in fathoms ~~feet~~ at MLW MLLW (data collected in Meters)

REMARKS: All times are UTC, revisions and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

All depths listed in this report are referenced to mean lower low water unless otherwise noted.

\* Change No 1 dated 3/30/98 SURE/AUGUS 8/99 MLR



**H-10808**

**H-10811**

**H-10807**

**H-10810**

# PROGRESS SKETCH

OPR-O340-RA  
Lynn Canal, Alaska  
April - June 1998  
Capt. A. D. Anderson, NOAA  
Commanding  
Chart 17317

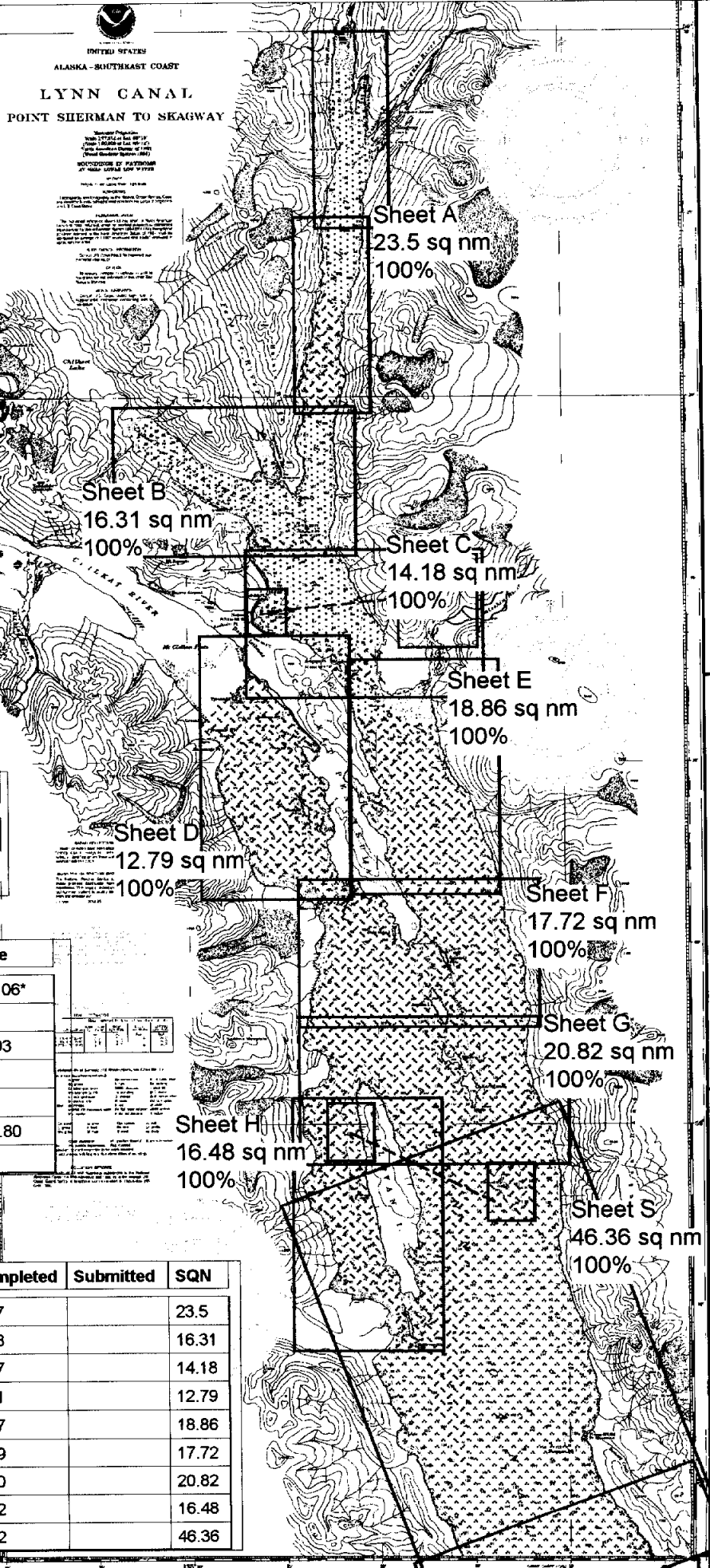


Downtime_Type	April	May	June
Weather - Hr	0	0	0
Mechanical -Hr	0	0	0
Electronic -Hr	1	0	0

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



Sheet A  
23.5 sq nm  
100%

Sheet B  
16.31 sq nm  
100%

Sheet C  
14.18 sq nm  
100%

Sheet E  
18.86 sq nm  
100%

Sheet D  
12.79 sq nm  
100%

Sheet F  
17.72 sq nm  
100%

Sheet G  
20.82 sq nm  
100%

Sheet H  
16.48 sq nm  
100%

Sheet S  
46.36 sq nm  
100%

# Descriptive Report to Accompany Hydrographic Survey H-10811

Field Number RA-10-7-98

Scale 1:10,000

May 1998

NOAA Ship RAINIER

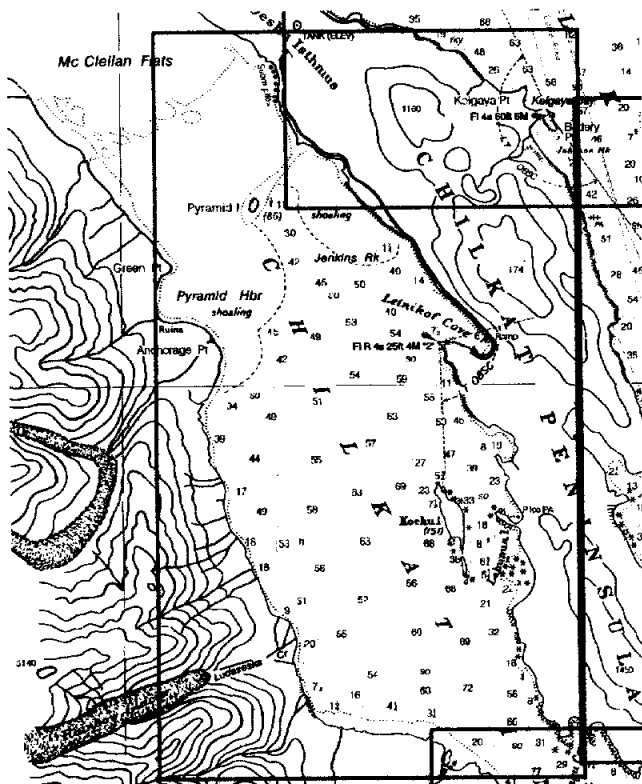
Chief of Party: Captain Alan D. Anderson, NOAA

## A. PROJECT ✓

This hydrographic survey was completed as specified by Project Instructions OPR-0340-RA dated March 5, 1998 and Change No. 1 dated March 30, 1998. Survey H-10811 corresponds to sheet D as defined in the sheet layout. This survey will provide contemporary hydrographic survey data as part of a continuing program to improve chart coverage of the Inside Passage in southeast Alaska. Requests for hydrographic surveys and updated charts in this area have been received from the Southeastern Alaska Pilot's Association (SEAPA) and the commercial fishing industry.

## B. AREA SURVEYED ✓ SEE EVAL REPORT, SECTION B.

The survey area is in Chilkat Inlet. The survey's northern limit is the shoal area at the mouth of the Chilkat River and the southern limit is latitude 59° 06' 10" to the shoreline. The survey's western limit is the shoreline and the eastern limit is the Chilkat Peninsula. Data acquisition was conducted from May 11 to June 21, 1998.



## C. SURVEY VESSELS ✓

Data were acquired by RAINIER\* and her survey launches as noted in the Survey Information Summary included with this report.

\*FOR BOTTOM SAMPLES ONLY

This project included the use of a new vessel configuration. Launches 2121 and 2123 were configured during the 1997-1998 winter inport period with Reson SeaBat 8101 Shallow Water Multibeam (SWMB) systems. The center of the launch keels were cut and modified to house the SWMB transducers. The originally installed DSF-6000N single beam transducers remained installed as before. **SWMB SYSTEMS WERE NOT USED FOR THIS SURVEY.**

#### D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired using HYPACK version 7.1a and preliminary processing was accomplished with HPS and MapInfo. Final Detached Positions, Features, and Soundings based on predicted tides were saved in MapInfo 4.15 format. The MapInfo workspaces are described in Appendix VIII. \*

#### E. SONAR EQUIPMENT ✓

No multi-beam echo sounder equipment was used on this survey. No side-scan sonar equipment was used on this survey. **CONCUR**

#### F. SOUNDING EQUIPMENT ✓

The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. The Knudsen 320M is a dual frequency, thermal depth sounder using the same transducer frequencies. Serial numbers are included on the headers of the daily Raw Master Printouts.\* DSF-6000N soundings were acquired in meters using the High + Low, high frequency digitized setting.

Note: The newly installed Reson SeaBat 8101 SWMB systems were undergoing field testing and software improvements during the performance of this survey. Consequently, the SWMB systems were not used for this survey. **CONCUR**

#### G. CORRECTIONS TO ECHO SOUNDINGS ✓

Three sound velocity casts were used for this survey. Information on the casts is included in the Survey Information Summary report. **(ATTACHED)**

The sound velocity casts were acquired with SBE SEACAT Profiler (S/N 219), calibrated December 15, 1996. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.1, 1996), in accordance with Hydrographic Survey Guideline (HSG) No. 69. A printout of the Sound Velocity Corrector Table used in the HPS Post Survey program is included in the "Separates to be Included with Survey Data, IV.\*Sounding Equipment Calibrations and Corrections".

A static transducer depth was determined using FPM Fig 2.3 for vessels 2122, 2124, 2125, and 2126 in the spring of 1998. 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. The data for all vessels were collected in the Strait of Juan de Fuca, Washington in the spring of 1998. All offset tables\* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 2,4,5, and 6 correspond to the last digit of the vessel number. The offset tables are included with project data for OPR-O340-RA. Launches 2122, 2124, 2125, and 2126 are not equipped with heave, roll, and pitch sensors. **CONCUR**

The Oceanographic Products and Services Division, User Services Branch (N/CS44), 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 tide corrector tables are included in Appendix V\* of this report. Tidal correctors as provided in the project instructions for H-10811 are provided in the Survey Information Summary included with this report.

\* FILED WITH THE SURVEY RECORDS

Juneau, Alaska (945-2210), Sitka, Alaska (945-1600), and Skagway, Alaska (945-2400) are the primary control stations for datum determination. RAINIER personnel installed a Sutron 8200 tide gage at Chilkat Inlet (945-2421) on May 10, 1998, and the gage was removed on June 21<sup>st</sup>, 1998. 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 at the completion of the project. *Approved tide note dated February 16, 1999 is attached.*

#### H. CONTROL STATIONS ✓ SEE EVAL REPORT, SECTION H.

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-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 REPORT, SECTION I.

All soundings were positioned using differential GPS. Primary control was the VHF differential reference station at TAI. The US Coast Guard Beacon at GUSTAVUS and a VHF differential reference station at ACE 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, TAI and GUSTAVUS, 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 reference stations. TAI was compared to GUSTAVUS at least once a week while installed. Some outliers were noted, but none indicated systematic or continuous errors in either the GUSTAVUS beacon or the VHF station at TAI. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-O340-RA.

#### J. SHORELINE ✓ SEE EVAL. REPORT, SECTION J. TP-01524

The shoreline manuscript from Coastal Mapping survey CM-8709 was supplied by N/CS341 in the form of raster image files in a .PCX format for import to MapInfo and Hypack. There is no registered photogrammetric source available north of latitude 59° 10' N in Chilkat Inlet. NOS Chart 17317 (18<sup>th</sup> edition, June 14, 1997) was enlarged to a scale of 1:40,000 and the shoreline was digitized to provide a general idea of where land is in the area of the survey.

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, with the exception of the mouth of the Chilkat River, where the shoaling is quite extensive. 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 data 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 17317, plotted by RAINIER personnel, as well as digital overlay of data on the BSB chart image in MapInfo.

*SHORELINE SHOWN ON THE SMOOTH IN BLACK ORIGINATES FROM DIGITIZED FILES OF TP-01524. SHORELINE SHOWN IN BROWN ORIGINATES FROM CHART 17317, 18<sup>TH</sup> ED., JUNE 14, 1997 AND IS SHOWN ON THE SMOOTH SHEET FOR ORIENTATION PURPOSES ONLY.*

*\* Filed with the hydrographic data.*

Shoreline manuscript features matched the shoreline as observed during the current survey except for the following.

Shoreline Manuscript Feature	Geographic Position	Observed Feature	
Rock	59° 06' 56" N 135° 22' 17" W ✓ 59° 07' 18" N 135° 22' 36" W ✓	Ledge LEDGE	Concur
Rock	59° 06' 24" N 135° 21' 39" W ✓	Reef (S)	Concur
None	59° 08' 19" N 135° 23' 24" W ✓	Foul Area	Concur
None	59° 08' 40" N 135° 22' 42" W ✓	Boat Ramp and Pilings	Concur
None	59° 07' 46" N 135° 22' 48" W ✓ 59° 08' 15" N 135° 23' 07" W ✓ 59° 08' 12" N 135° 23' 04" W ✓ 59° 08' 09" N 135° 23' 01" W ✓	Rock * (c) " * Cov 1ft " * Cov 1ft " * Cov 2ft	Concur
None	59° 08' 43" N 135° 22' 39" W ✓ 59° 10' 06" N 135° 23' 52" W	Ledge Ledge	Concur Concur

The charted shoreline should be revised using the manuscript shoreline and fieldwork notes as recorded in the MapInfo digital file named "Shoreline\_Features" within the bounds of the survey. *CONCUR*

### K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography. There was a total of 25.24 nautical miles of crosslines, comprising 8.7% of mainscheme hydrography.

### L. JUNCTIONS ✓ SEE EVAL REPORT, SECTION L.

Contemporary survey H-10810 junctions with H-10811. Soundings on these surveys were found to be in good agreement. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

### M. COMPARISON WITH PRIOR SURVEYS ✓ SEE EVAL. REPORT, SECTION M.

Three prior surveys were conducted in the H-10811 area: H-2057 (1:40,000, 1890), and H-4226WD (1:40000, 1922), and ~~FE-98~~ (1:240, 1951). Most prior survey soundings were found to be in fair agreement with those from the current survey. Least depths from the current survey were more shoal or in agreement with prior surveys, with a few exceptions comparing to H-2057 depths along the western shore of Chilkat Inlet. The discrepancies also coincide with areas where the modern digital shoreline is noticeably different than the shoreline depicted for the 1890 survey and vary from the current survey with a range from 5 to 23 fathoms. *Concur with clarification*

H-2057 Depth (fm)	H-10811 Depth (fm)	H-10811 Fix #	Geographic Position
66	71.3 ✓	44010	59° 06' 53" N 135° 22' 48" W ✓
29	* 52 ✓	43766	59° 06' 19" N 135° 22' 50" W ✓
58	63.1 ✓	43662	59° 06' 54" N 135° 23' 54" W ✓
35	49.2 ✓	43647	59° 06' 52" N 135° 24' 10" W ✓

\* 48 fm sounding transferred from H-10810. Similar depths are found on the present survey within 100 meters of the prior soundings listed above and on following page.



H-2057 Depth (fm)	H-10811 Depth (fm)	H-10811 Fix #	Geographic Position
33	40.1 ✓	43238	59° 06' 54" N 135° 25' 14" W ✓
3 *	7.75 - 7.9 ✓	44304	59° 08' 28" N 135° 23' 05" W ✓
27	<del>47.7</del> 48 ✓	45919	59° 07' 40" N 135° 26' 29" W ✓
4	<del>13.3</del> 12.7 - 13.5 ✓	22599	59° 10' 46" N 135° 28' 48" W ✓

\* Miscalculated as 2 fm depth on chart.

Differences between the current survey and priors can probably be attributed to scale and improved modern positioning and sounding equipment. It is possible that the prior survey soundings were positioned relative to an erroneously positioned shoreline, or that there was a horizontal control inaccuracy in the survey area that affected both the shoreline delineation and the sounding positions. This position error is evident in the soundings east of Kochu Island. Final comparisons will be done at PHB after reduction to final sounding datum using tidal information collected concurrently with this survey. *Concur with clarification.*

**N. ITEM INVESTIGATIONS ✓ SEE EVAL. REPORT, SECTION N.**

There were four AWOIS items assigned for survey H-10811, the following four pages address AWOIS items 52395, 52399, 52400, and 52401. *CONCUR*

Item Investigation #1 ✓

AWOIS # : 52395	DN: 146
CHART #: 17317 (1:77,812, 18 <sup>th</sup> Edition, 6/14/97)	VESNO: N/A
ITEM DESCRIPTION: Submerged piles	
SOURCE: Chart 17317	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	59° 12' 57" N	135° 27' 06" W	
OBSERVED:	59° 12' 32" N ✓	135° 26' 57" W ✓	N/A
OBSERVED:	59° 12' 33" N ✓	135° 26' 56" W ✓	N/A
OBSERVED:	59° 12' 43" N ✓	135° 27' 06" W ✓	N/A
OBSERVED:	59° 12' 46" N ✓	135° 27' 06" W ✓	N/A
POSITIONED BY:	GPS & DGPS*	DATUM:	MLLW (NAD 83)

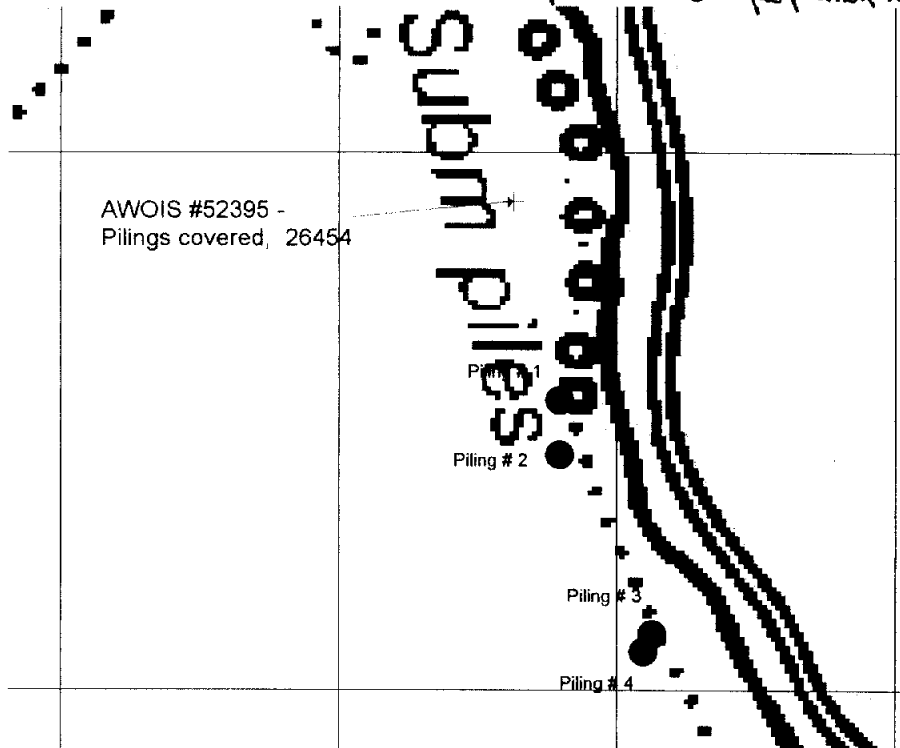
METHOD OF INVESTIGATION: Visual search at high tide from survey launch, water visibility less than 1 meter, 10 minute, 200 meter radius search; Visual search at low tide by wader, holding a handheld GPS receiver.

FINDINGS: No pilings were sighted during the visual search from the survey launch. The launch took a detached position from its point of observation (fix 26454, Lat 59-12-57N, Long 135-27-11). Four pilings were found by the wader to be exposed at low water, covered at high water. The pilings were positioned using a handheld non-differential GPS receiver.

Charting Recommendations

The hydrographer recommends removing the seven pilings at the charted positions and charting the four pilings found during this survey. CONCUR

*Pilings were shown on the smooth sheet as portrayed on the hydrographer's detached position and shoreline verification plot. These pilings do have unique position numbers.*



Item Investigation #2 ✓

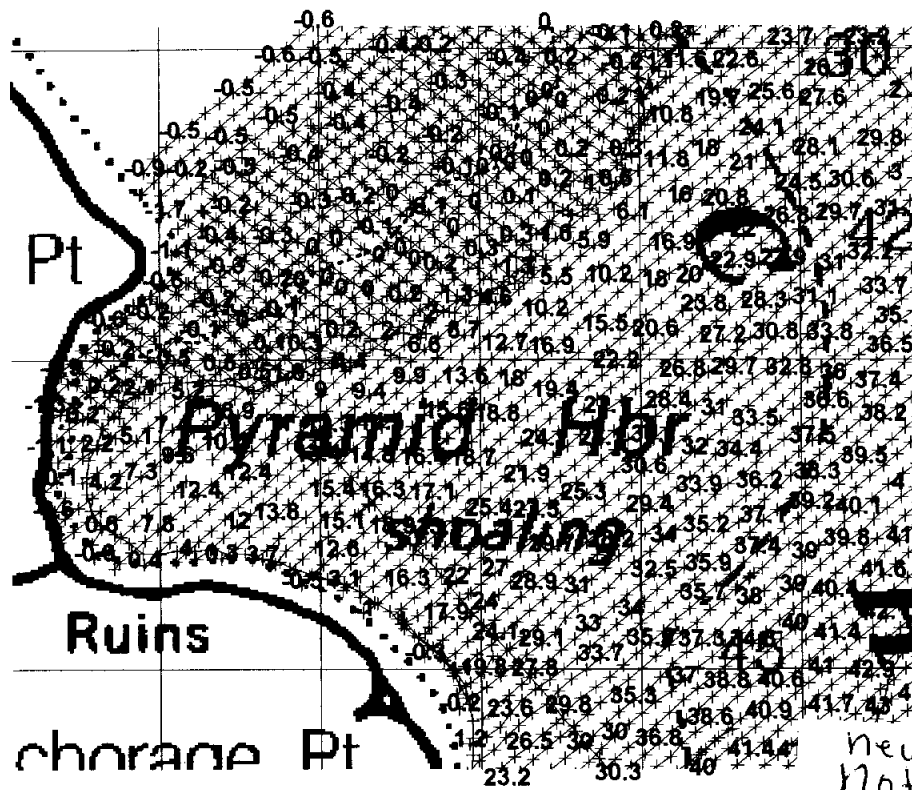
AWOIS # : 52399	DN: 171
CHART #: 17317 (1:77,812, 18 <sup>th</sup> Edition, 6/14/97)	VESNO: 2122
ITEM DESCRIPTION: Shoaling near Pyramid Island and Pyramid Harbor	
SOURCE: Chart 17317	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	59° 10' 42" N	135° 28' 00" W	
OBSERVED:	59° 11' 12" N ✓	135° 27' 43" W ✓	30254 - 30808
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: Twenty-five-meter spacing echosounder development.			
FINDINGS: Echosounder development on DN 171 determined that shoaling has occurred east-northeast of Pyramid Harbor, but not as depicted on the current chart. See comment below			

Charting Recommendations

The hydrographer recommends removing the "shoaling" text south of Pyramid Harbor at the charted position and charting the soundings found during this survey. *Concur with clarification, see Eval Rpt. sections M and T.*



*new positions  
not shown  
on H-drawing  
MCR*

Item Investigation #3 ✓

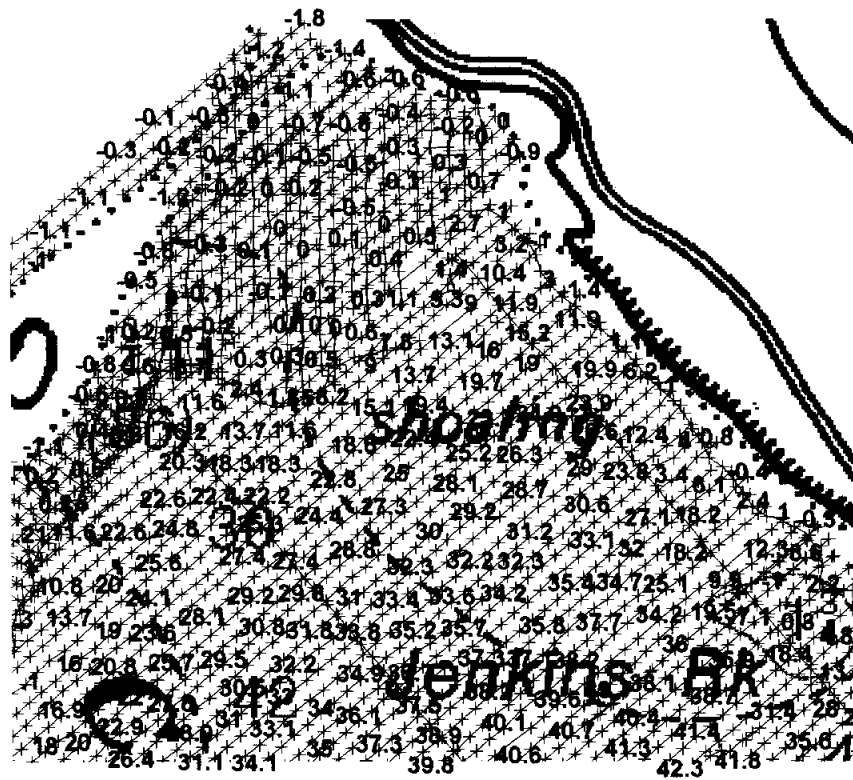
AWOIS # : 52400	DN: 171 & 172
CHART #: 17317 (1:77,812, 18 <sup>th</sup> Edition, 6/14/97)	VESNO: 2122
ITEM DESCRIPTION: Shoaling near Pyramid Island and Jenkins Rock	
SOURCE: Chart 17317	

Geographic Position

	LATITUDE	LONGITUDE	POSITION #
CHARTED:	59° 11' 36" N	135° 26' 00" W	
OBSERVED:	59° 11' 46" N ✓	135° 26' 30" W ✓	30809-30855,31168-31416
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: Twenty-five-meter spacing echosounder development.			
FINDINGS: Echosounder development on DN 171 & 172 determined that shoaling has occurred east of Pyramid Island, but not as depicted on the current chart. <i>See comment below</i>			

Charting Recommendations

The hydrographer recommends removing the "shoaling" text southeast of Pyramid Island at the charted position and charting the soundings found during this survey. *Concur with clarification. See Eval Rpt, sections M and T.*



Item Investigation #4 ✓

AWOIS # : 52401	DN: 132 & 170
CHART #: 17317 (1:77,812, 18 <sup>th</sup> Edition, 6/14/97)	VESNO: 2122
ITEM DESCRIPTION: Piles	
SOURCE: Chart 17317	

Geographic Position

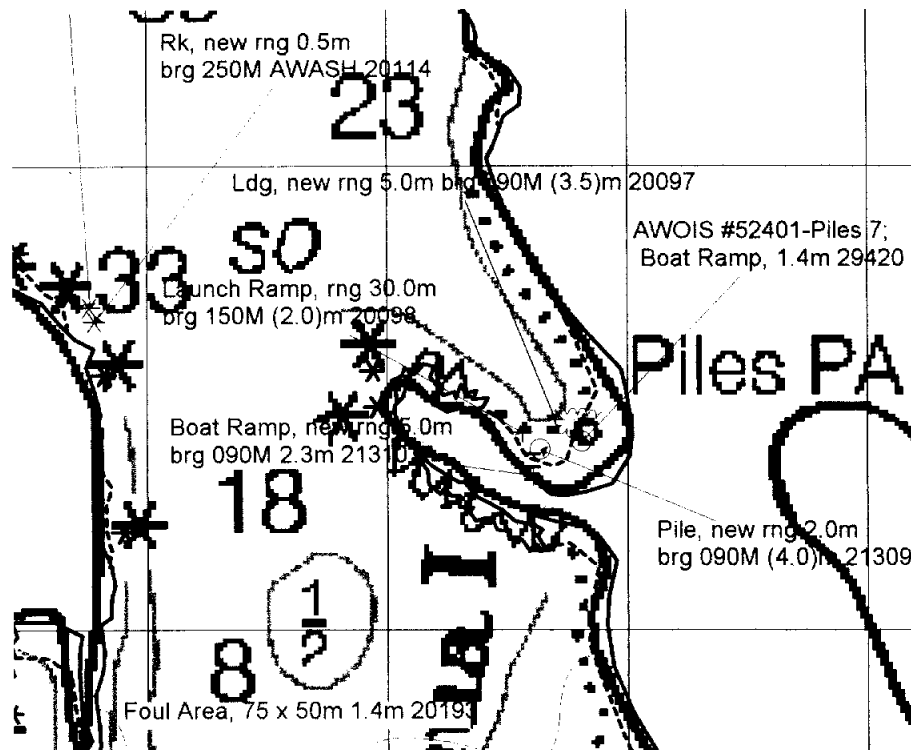
	LATITUDE	LONGITUDE	POSITION #
CHARTED:	59° 08' 42" N	135° 22' 36" W	
OBSERVED:	59° 08' 41.565" N	135° 22' 40.601" W	21309, 21310, 29420
POSITIONED BY:	DGPS	DATUM:	MLLW (NAD 83)
METHOD OF INVESTIGATION: Visual Search			
FINDINGS: A visual search was conducted from a survey launch during a period of low tide. A ledge was observed at the charted position of the "Piles PA" (DP 20097). No piles were sighted at the charted position of the "Piles PA" (DP #29420). However, seven piles were seen 80-90 meters to the south-west lining a nearby boat ramp leading into the cove. The boat ramp and outermost pile were positioned with DP # 21310 and 21309. <i>Concur</i>			

*-mcr  
8/4/99*

Charting Recommendations

The hydrographer recommends charting the pilings and boat ramp as found during this survey.

*CONCUR with  
Clarification.  
See Encl Rpt. sections  
J and P.*



**O. COMPARISON WITH THE CHART** ✓ SEE EVAL. REPORT, SECTION O.

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

Chart	Scale	Edition Number	Date	Datum
17317	1:77,812	18th	June 14, 1997	NAD 83
17300	1:209,978	27th	August 14, 1993	NAD 83

Charted features matched the shoreline as observed during the current survey except for the following.

Charted Feature	Geographic Position	Observed Feature
Rock	59° 07' 14" N 135° 22' 34" W ✓	Rock Ledge ✓
Rock*	59° 06' 26" N 135° 21' 56" W ✓	None ✓
None	59° 08' 19" N 135° 23' 24" W ✓	Foul Area ✓
None	59° 10' 06" N 135° 23' 52" W ✓ 59° 08' 43" N 135° 22' 39" W ✓	Rock Ledge ✓
None	59° 08' 12" N 135° 23' 04" W ✓ 59° 08' 15" N 135° 23' 07" W	Rock * Cov 1 Ft Rock * Cov 1 Ft

\* The charted rock at 59° 06' 26.3" N 135° 21' 56.3" W falls in an area with depths between 20 and 30 fathoms. No indication of this rock was found during sounding or shoreline investigations at minus tides. The ship's source material for this area does not contain a source document for this rock. It is not on the current shoreline manuscript. The charted location of this rock coincides with a "rky" bottom sample shown on prior survey H-2057. Current information suggests that this rock has been mischarted. Unless another reliable source can be found, the hydrographer recommends that this rock be removed. *concur with clarification. See Eval Rpt, Section M.*

It appears that many of the prior survey soundings immediately adjacent to the shoreline at the western shoreline of Chilkat Inlet have been moved offshore to allow cartographic representation without interrupting the shoreline. Their relative position with respect to the shoreline on the prior does not agree with their relative position on the chart and their depths do not agree (are shoaler) with those on this survey. *concur*

The ½ -fathom sounding at 59° 08' 28" N 135° 23' 05" W and the area southeast of Kochu Island were developed with twenty-five meter line spacing. The depths from the current survey near the ½ -fathom charted sounding range from 7 to 10 fathoms. The modern soundings near the ½ -fathom charted sounding are adequate to show that it is in error, given the depth of the water. The soundings near the charted 6 ¾ are ½ fathom and near the 5 ¼ fathom they are currently 2 ½ fathoms. This is not an area that is shoaling because of sediment transport indicating that these two charted soundings were taken at some other location or they are accurate but happened to fall between much shoaler soundings. It is possible that all three of these charted soundings were taken from a single sounding line passing midway between the Kochu Island and the mainland that was very poorly controlled. Given the date of the prior survey and the location of this survey line, it is likely that the control used was dead reckoning. *concur with clarification, see Eval Rpt, section M*

Final sounding comparisons will be made at PHB after reduction to final vertical datum.

**Dangers to Navigation**

\* Four dangers to navigation were discovered during the survey and reported to the Seventeenth Coast Guard District. A rock was found at 59° 08' 15.073" N, 135° 23' 07.129" W, a ½ fathom sounding at 59° 08' 15.847" N, 135° 23' 18.339" W, a 1-1/4 fathom sounding at 59° 08' 04.230" N, 135° 23' 07.564" W, and a 4-1/2 fathom sounding at 59° 06' 18.880" N, 135° 21' 37.266" W. See Appendix I, Danger to Navigation, for details. *(FILED WITH THIS REPORT). \* Based on predicted tides*

**P. ADEQUACY OF SURVEY** ✓ SEE EVAL. REPORT, SECTIONS O and P.

Survey H-10811 is complete and adequate to supersede prior soundings and features in their common areas. *Concur with Clarification.*

**Q. AIDS TO NAVIGATION** ✓ SEE EVAL. REPORT, SECTION Q.

Letnikof Cove Light 2(Light List # 23895) was positioned on DN 140. The light is charted adequately on chart 17317. Refer to Section Q\* in the Appendices for more information on the discrepancy between the charted position and the surveyed position. **\*ATTACHED TO THIS REPORT**

**R. STATISTICS** ✓

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

**S. MISCELLANEOUS** ✓

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

Choppy sea conditions were noticed in northern Chilkat Inlet on DNs 131 and 132, with brisk winds coming from the southeast. However, waters in the southern end of Chilkat Inlet were surprisingly calmer, even with similar winds.

**T. RECOMMENDATIONS** ✓

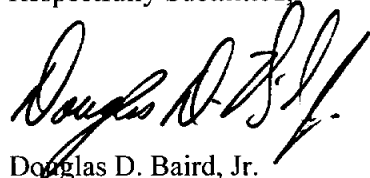
The hydrographer recommends that photogrammetric shoreline be acquired for survey areas before the hydrographic field party begins the survey. Precise, low-water shoreline information can greatly facilitate the acquisition of soundings and expedite the shoreline verification process. The hydrographer also recommends adding a note to the chart near the head of Chilkat Inlet describing the rate of shoaling near Pyramid Island due to sedimentation from the Chilkat River. Suggested text follows: "The zero fathom curve in Chilkat Inlet at the mouth of Chilkat River, is shown as surveyed in 1998. Significant amounts of sediment are being deposited in this area by the river, resulting in the advance of the zero fathom curve an average of 75 feet per year (based on the position change from 1890 to 1998)." *Concur with Clarification.*

**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-O340-RA Horizontal Control Report	June 1998	N/CS34
Project related data for OPR-O340-RA	Incremental	N/CS34

Respectfully Submitted,



Douglas D. Baird, Jr.  
Lieutenant, NOAA

Approved and Forwarded,



Alan D. Anderson  
Captain, NOAA  
Commanding Officer

## Section Q: Descriptive Report Insert ✓

Name of Aid: Letnikof Cove Light 2  
 Light List #: 23895

Method of Positioning                      GPS:     DGPS:     Other: \_\_\_\_\_

**Positioning Information**

	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Charted Pos.	59/10/24.6	135/24/03.6
Survey Pos.	59/10/25.260	135/24/02.323 ✓

	<u>Easting</u>	<u>Northing</u>
Charted Pos.	41365.1	158564.2
Survey Pos.	41385.4	158584.6

Difference between Charted and Surveyed Position:                      Distance: 29 meters  
 (Bearing from Surveyed to Charted Position)                      Bearing: 225 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:



## 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



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, 27<sup>th</sup> edition, August 14, 1993 & chart 17317, 18<sup>th</sup> 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,

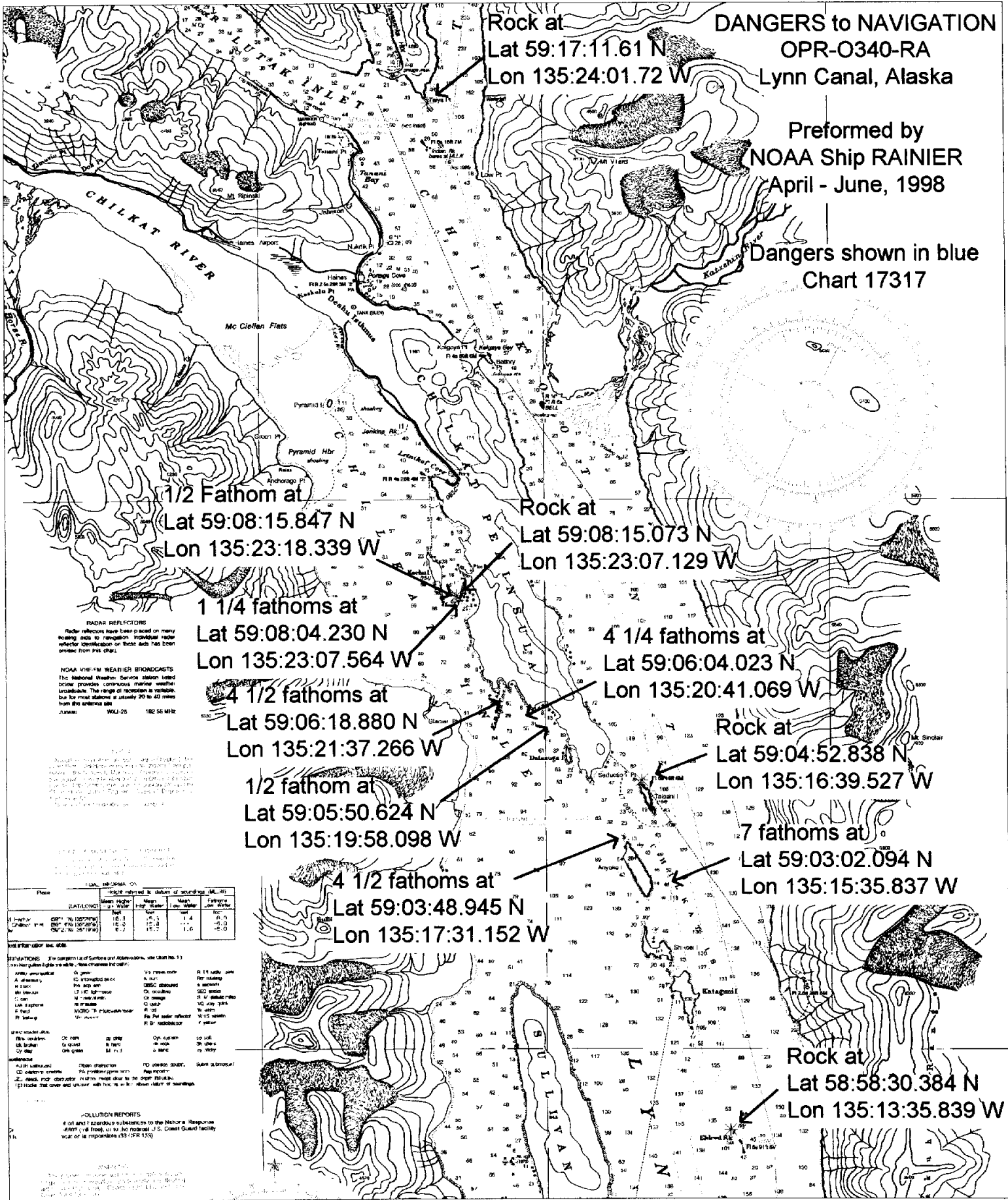
*Alan D. Anderson*  
Alan D. Anderson  
Captain, NOAA  
Commanding Officer

Attachment

Cc: NIMA  
PMC  
N/CS261  
N/CS34



**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

Performed 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 REFLECTORS**  
Radar reflectors have been placed on many sounding aids to improve radar detection of these aids has been omitted from this chart.

**NOAA VHF-M 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 at least 200 miles from the antenna site.

**USA, IN-CANAL ON**

Place	Mean depth	Mean depth	Mean depth	Mean depth
(LAT/LON)	100 fathoms	100 fathoms	100 fathoms	100 fathoms
1. 59° 17' 11.61 N 135° 24' 01.72 W	10.0	10.0	10.0	10.0
2. 59° 08' 15.847 N 135° 23' 18.339 W	10.0	10.0	10.0	10.0
3. 59° 08' 04.230 N 135° 23' 07.564 W	10.0	10.0	10.0	10.0
4. 59° 06:04.023 N 135:20:41.069 W	10.0	10.0	10.0	10.0
5. 59° 06:18.880 N 135:21:37.266 W	10.0	10.0	10.0	10.0
6. 59° 05:50.624 N 135:19:58.098 W	10.0	10.0	10.0	10.0
7. 59° 03:02.094 N 135:15:35.837 W	10.0	10.0	10.0	10.0
8. 59° 03:48.945 N 135:17:31.152 W	10.0	10.0	10.0	10.0
9. 58° 58:30.384 N 135:13:35.839 W	10.0	10.0	10.0	10.0

**ABBREVIATIONS** - The comparison of Symbols and Abbreviations, see Chart No. 1.  
The following table is a list of symbols and abbreviations used on this chart.

**SYMBOLS**

Symbol	Meaning	Symbol	Meaning
▲	Lighted buoy	○	Lighted buoy
●	Unlighted buoy	○	Lighted buoy
○	Lighted buoy	○	Lighted buoy
○	Lighted buoy	○	Lighted buoy

**POLLUTION REPORTS**  
All oil and hazardous substances to the National Response Center (NRC) must be reported to the Coast Guard facility near or at the responsible party (SPR 153).

**Date:** 8/3/98  
**Sender:** XO Rainier  
**To:** Chief Survey Technician Rainier, Doug Baird  
**cc:** CO Rainier, FOO Rainier  
**Priority:** Normal  
**Subject:** Fwd:RE: Dangers to Navigation for Lynn Canal, AK

---

Forward Header

**Subject:** RE: Dangers to Navigation for Lynn Canal, AK  
**Author:** WWiedenhoeft@pacnorwest.uscg.mil (William CDR Wiedenhoeft)  
**Date:** 8/3/98 7:52 AM

Thanks for the info! We'll be sure to get it in the NTM. -- CDR Bill Wiedenhoeft

> -----Original Message-----

> From: XO\_Rainier%Rainier@ccmail.rdc.noaa.gov  
 > [SMTP:XO\_Rainier%Rainier@ccmail.rdc.noaa.gov]  
 > Sent: None  
 > To: Wiedenhoeft, William CDR  
 > Cc: Dennis=Hill%PHS%NCG245@BANYAN.rdc.noaa.gov;  
 > Kathy=Timmons%PHS%NCG245@BANYAN.rdc.noaa.gov;  
 > Lynn=Preston%NDS%NCG22@BANYAN.rdc.noaa.gov;  
 > Chief\_Survey\_Technician\_Rainier@ccmail.rdc.noaa.gov;  
 > CO\_Rainier@ccmail.rdc.noaa.gov  
 > Subject: Dangers to Navigation for Lynn Canal, AK

> 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	Depth	Latitude (N)	Longitude (W)	Position	Depth
Survey	Type	(fm)	Number	Meters	Number
	Rock	59:17:11.610	135:24:01.720	50666	
	H-10736				
	Submrged Rk	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

**ADVANCE  
INFORMATION**

> 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-0340-RA and Danger to Navigation message RA-5-98.					
> More					
> information					
> on current RAINIER survey projects may be obtained by e-mail; contact					
> the Field					
> Operations					
> Officer at FOO.RAINIER@NOAA.GOV. Hard copy (letter) is being sent July					
> 31, 1998					
> by regular					
> mail.					
>					
>					
>					
>					
> Alan D. Anderson					
> Captain, NOAA					
> Commanding Officer					
>					
>					

# Survey Information Summary

**Project:**  **Project Name:**   
**Instructions Dated:**  **Project Change Info:**

Change #	Dated
1	3/30/98

**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
2122	4	9	5	3	10	10		
2124	4	3			1			
2125	2	3		1			1	
2126		1						

## Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
3		131	117	59/07/21	124-138
				135/23/00	
4		140	158.3	59/05/55	139-168
				135/21/16	
16		170	165.2	59/06/45	169-172
				135/22/50	

## Tide Zone Information

Zone #	Time Corr.	Height Corr.
SEA2B	000 hr 00 min	X1.01

## Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-2421	CHILKAT INLET	5/10/98	6/21/98

## Statistics Summary

Type	Total:
BS	14
DEV	37.52
DP	43
MS	291.31
S/L	14.1
SPLIT	247.21
XL	25.24

Percent XL:	8.7%
SQNM:	12.79

APPROVAL SHEET

for

H-10811

RA-10-7-98

Standard field surveying and processing procedures were followed in producing this survey in accordance with the Hydrographic Manual, <sup>Fourth</sup> ~~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



**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-10811

LOCALITY: Chilkat Inlet, Alaska

TIME PERIOD: May 11 - June 21, 1998

TIDE STATION USED: 945-2400 Skagway, AK

Lat. 59° 27.0'N Lon. 135° 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, AK

Lat. 59° 10.2'N Lon. 135° 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: SEA2, SEA2A, SEA2B.

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



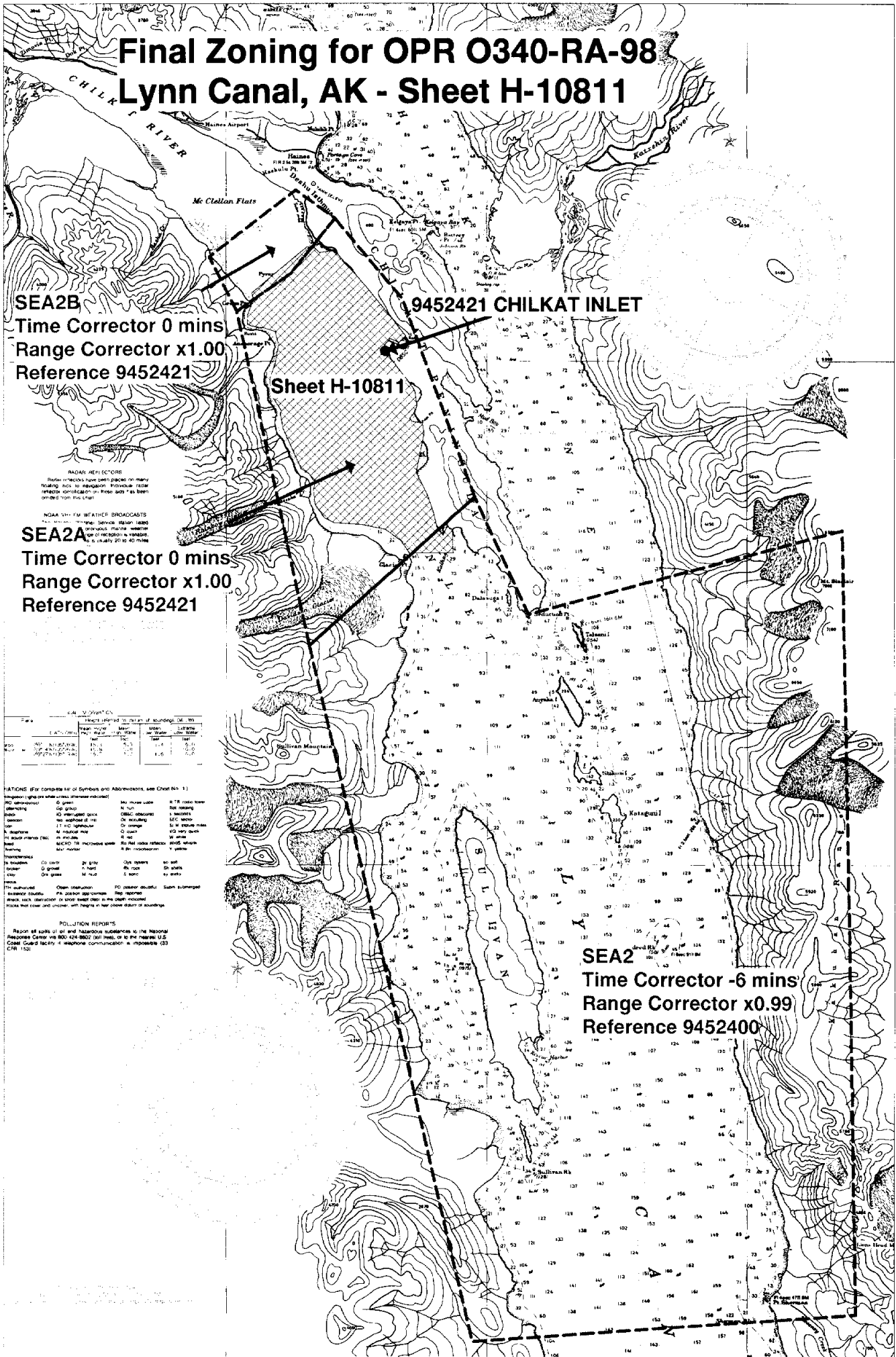


Final tide zone node point locations for OPR 0340-RA-98,  
Sheet H-10811.

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 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			
Zone SEA2B				
-135.493123	59.183157	945-2421	0	1.00
-135.51062	59.201175	945-2400	-6	0.99
-135.455402	59.222932			
-135.430336	59.213684			
-135.458521	59.195675			
-135.493123	59.183157			

# Final Zoning for OPR O340-RA-98 Lynn Canal, AK - Sheet H-10811



**SEA2B**  
Time Corrector 0 mins  
Range Corrector x1.00  
Reference 9452421

**9452421 CHILKAT INLET**

**Sheet H-10811**

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

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

**RADAR REFLECTORS**  
Radar reflectors have been placed on many floating aids to navigation. Electronic radar reflector identification on these aids has been ordered from the chart.

**NOAA VHF-FM WEATHER BROADCASTS**  
The Service Station listed provides marine weather information. The frequency and range of reception is variable but usually 20 to 40 miles.

Chart	Scale	Depth	Soundings	Mean	Low	High
100	1:50,000	10	10	10	10	10
101	1:50,000	10	10	10	10	10
102	1:50,000	10	10	10	10	10

- NOTATIONS** (For complete list of Symbols and Abbreviations, see Chart No. 1)
- Light (light on white unless otherwise indicated)
  - Red (red on white unless otherwise indicated)
  - Green (green on white unless otherwise indicated)
  - Black (black on white unless otherwise indicated)
  - Yellow (yellow on white unless otherwise indicated)
  - White (white on white unless otherwise indicated)
  - Orange (orange on white unless otherwise indicated)
  - Blue (blue on white unless otherwise indicated)
  - Grey (grey on white unless otherwise indicated)
  - Red (red on white unless otherwise indicated)
  - Green (green on white unless otherwise indicated)
  - Black (black on white unless otherwise indicated)
  - White (white on white unless otherwise indicated)
  - Orange (orange on white unless otherwise indicated)
  - Blue (blue on white unless otherwise indicated)
  - Grey (grey on white unless otherwise indicated)

**POLLUTION REPORTS**  
Report all spills of oil and hazardous substances to the National Response Center via 800-424-9303 (day time), or to the nearest U.S. Coast Guard facility if telephone communication is impossible (24 hrs).

GEOGRAPHIC NAMES

H-10811

Name on Survey	Source of Information										
	A	B	C	D	E	F	G	H	K		
	ONE CHART NO.	ON PREVIOUS SURVEY	CON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST			
ALASKA (title)	X		X								1
ANCHORAGE POINT	X		X								2
BATTERY POINT	X		X								3
CHILKAT (locale)	X		X								4
CHILKAT INLET	X		X								5
CHILKAT PENINSULA	X		X								6
CHILKAT RIVER	X		X								6
DESHU ISTHMUS	X		X								7
GLACIER POINT	X		X								8
GREEN POINT	X		X								9
JENKINS ROCK	X		X								10
JOHNSON ROCK	X		X								11
KALHAGU COVE	X		X								12
KELGAYA BAY	X		X								13
KELGAYA POINT	X		X								14
KOCHU ISLAND	X		X								15
LEHUNUA ISLAND	X		X								16
LETNIKOF COVE	X		X								17
LUDASESKA CREEK	X		X								18
LYNN CANAL (title)	X		X								19
McCLELLAN FLATS	X		X								20
PYRAMID HARBOR	X		X								21
PYRAMID ISLAND	X		X								22
RAINBOW GLACIER	X		X								23
											24
											25

Approved:

*Dennis J. Rossling*  
DEC 16 1998

**HYDROGRAPHIC SURVEY STATISTICS**

H-10811

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		1	SMOOTH OVERLAYS: POS., ARC, EXCESS		N/A
DESCRIPTIVE REPORT		1	FIELD SHEETS AND OTHER OVERLAYS		N/A
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):	TP-01524
PHOTOBATHYMETRIC MAPS (List):	N/A
NOTES TO THE HYDROGRAPHER (List):	N/A
SPECIAL REPORTS (List):	N/A
NAUTICAL CHARTS (List):	17317, 18th Ed., June 14, 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				
VERIFICATION OF SOUNDINGS				
VERIFICATION OF JUNCTIONS				
APPLICATION OF PHOTOBATHYMETRY				
SHORELINE APPLICATION VERIFICATION				
COMPILATION OF SMOOTH SHEET	238.0		238.0	
COMPARISON WITH PRIOR SURVEYS AND CHARTS		10.0	10.0	
EVALUATION OF SIDE SCAN SONAR RECORDS				
EVALUATION OF WIRE DRAGS AND SWEEPS				
EVALUATION REPORT		30.0	30.0	
GEOGRAPHIC NAMES				
OTHER: (Chart Compilation)		47.0	47.0	
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	238.0	87.0	325.0

Pre-processing Examination by <b>M. Bigelow</b>	Beginning Date 10/26/98	Ending Date 3/16/99
Verification of Field Data by <b>D. Doles, M. Bigelow, E. Domingo, R. Shipley</b>	Time (Hours) 238	Ending Date 7/08/99
Verification Check by <b>B. Olmstead</b>	Time (Hours) 8.0	Ending Date 7/16/99
Evaluation and Analysis by <b>R. Shipley</b>	Time (Hours) 30.0	Ending Date 7/20/99
Inspection by <b>B. Olmstead</b>	Time (Hours) 10	Ending Date 7/22/99

# EVALUATION REPORT

H-10811

## 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 green mud. Depths range from the Mean Lower Low Water (MLLW) line to 83 fathoms.

## C. SURVEY VESSELS

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

## D. AUTOMATED DATA ACQUISITION AND PROCESSING

Field acquisition and processing of survey data has been adequately discussed in the hydrographer's report, section D. Office processing was accomplished using the Hydrographic Processing System (HPS) and MicroStation 95.

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

The drawing files necessarily contain information that is not part of the HPS data set such as geographic names text, line-type data, and minor symbolization. In addition, those soundings deleted from the drawing for clarity purposes remain unrevised in the HPS digital files to preserve the integrity of the original hydrographic data set. Cartographic codes used to describe the digital data are those authorized by 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; Skagway, AK, 945-2400 and Chilkat Inlet, Ak 945-2421.

## **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 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:	-1.172 seconds	(-36.254 meters)
Longitude:	6.588 seconds	(104.689 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 exceeded limits in terms of HDOP during single beam data collection. 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.

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 map TP-01524 1:20,000, was compiled on NAD83 and applies to this survey. 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 Chart 17317, 18<sup>th</sup> Edition dated June 14, 1997 and is 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.

In addition, the following shoreline manuscript item is noted. A pier shown on TP-01524 at latitude 59/08/40, longitude 135/22/40 was not specifically investigated and or addressed during survey operations. A row of piles was found just west of the pier in the same

orientation. However, these items were not associated as one in the same feature and have both been shown on the smooth sheet.

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.

There were no MHW revisions on this survey.

## **K. CROSSLINES**

Crosslines are discussed in the hydrographer's report.

## **L. JUNCTIONS**

Survey H-10811 junctions with the following survey:

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10810	1998	1:10,000	South

The junction with survey H-10810 is complete. The examination reveals good agreement between soundings and standard depth curves. A few soundings have been transferred from the junctional surveys to better portray the common area resulting in adequate junctions between these contemporary surveys. A "Joins" note has been added to the smooth sheet where applicable.

## **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. A comparison was made using a digital copy of H-2057. The registration and legibility of this prior survey to the present survey was good.

Comparison with the prior survey is divided into two distinct geographic areas and is discussed as follows;

From Kahlagu Cove to latitude 59°10'30"N, the present survey reflects consistently shoaler depths of 2-3 fathoms. Comparison of standard depth curves in this area reveal little change in configuration except where present hydrography defined new and or existing shoal areas.

Above latitude 59°10'30"N from Pyramid Harbor to Jenkins Rock and northwest to Mc Clellan Flats, significant shoaling has occurred since 1890-95. General differences of 5-10 fathoms are readily seen in the Pyramid Cove and Jenkins Rock area with even larger differences centered around McClellan Flats. The most prominent area of shoaling which has occurred since 1890-95 is in the area of McClellan Flats. Here, shoaling from 10-20 fathoms has taken place over the past 108 years. Deposition of material from the Chilkat River has created a delta across the river mouth which rises up rapidly to Mean Lower Low Water (MLLW) from ten fathom depths. The Mean Lower Low Water Line has shifted northeast approximately 2500 meters since the prior survey work.

Other than the larger differences with the prior survey, the evaluator believes the entire survey area of the present survey has been largely effected to some degree to the deposition of material flowing out of the Chilkat River. Justification for smaller changes can probably be attributed to better bottom coverage, improved positioning and sounding techniques, and relative accuracy of the data acquisition methods.

The charted ½ fathom sounding at latitude 59/08/30N, longitude 135/23/09W appears to originate from a three fathom sounding shown on H-2057. This depth falls between prior soundings of 6, 8 ¾, and 9 ½ and is shown with what appears to be an 18-foot depth curve. This is substantiated by the fact that the prior survey is shown in feet to 18 with an associated depth curve and in fathom values thereafter. The evaluator believes the prior 3 sounding is actually a fathom depth which has been miscompiled. Additional discussion regarding the charted ½ sounding is found in the hydrographer's report, section O.

Additional discussion of prior survey comparisons is found in the hydrographer's report, section M.

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

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-4226WD	1922	1:10,000

The wire-drag survey listed above covers the entire area of the present survey. The comparison was made using a digital copy. The registration and legibility of the digital copy was good.

The following charted soundings originate from leadline depths shown on H-4226 WD. The present survey soundings were found to be significantly deeper (19-30 fathoms) and are listed below:

<u>Prior Depth</u>	<u>Present Depth</u>	<u>Latitude</u>	<u>Longitude</u>
8	37	59/09/24N	135/23/14W
9	34	59/07/50N	135/26/24W
7 ½	36	59/07/05N	135/26/21W
16	45	59/07/00N	135/25/10W
4 ¼	28	59/06/53N	135/24/57W
3 ¼	22	59/06/50N	135/24/18W

Fifty meter line spacing was conducted in these areas with no significant indication of abrupt shoaling. These soundings all plot close to the shoreline and are likely positioned incorrectly and or have been generalized offshore for charting purposes. Similar depths were found by the present survey within 100 meters of those prior depths. The evaluator recommends removing the charted soundings and charting this area based on the present survey.

The remaining areas of the prior work reflect wire drag sweeps set to specific depths with no associated sounding information. Charted soundings originating from this prior drag survey has been satisfactorily addressed and should be superseded by the present survey.

## **N. ITEM INVESTIGATIONS**

There were four AWOIS items assigned to this survey. All items were adequately addressed in section N of the hydrographer's report and the attached item investigation reports. Additional information is noted in the evaluation report, sections J and O.

## **O. COMPARISON WITH CHART**

Survey H-10807 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 and miscellaneous sources. The prior surveys and miscellaneous source data have been adequately addressed in section M and in the hydrographic report, section N and require no further discussion except as follows;

The present survey coverage is considered adequate to remove the charted green tint.

The application of this survey to charts of a scale less than 1:40,000 may require the generalization of features such as ledges, and reefs. The recommended charting disposition of specific ledges or reefs is their depiction as isolated rocks. The application of this survey to charts of a scale greater than 1:40,000 may be accomplished without generalization of features.

Two floating piers were located during the course of this survey at latitude 59/10/22N, longitude 135/23/30W and latitude 59/10/30N, longitude 135/10/24W. However, two piers charted at latitude 59/10/21N, longitude 135/23/22W and latitude 59/10/26N, longitude 135/23/12W originating from an unknown source were not addressed by the hydrographer during survey operations. It is the evaluator's recommendation to retain the charted piers as well as the surveyed floating piers.

Survey H-10807 is adequate to supersede charted hydrography within the common area.

b. Dangers To Navigation

Four dangers to navigation were discovered during survey operations. There were no additional dangers found during office processing. Dangers to Navigation Report dated July 27, 1998 is attached.

**P. ADEQUACY OF SURVEY**

Hydrography contained on survey H-10807 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:

The shoreline manuscript pier and two charted piers in Letnikof Cove discussed in sections J and O of this report, were not addressed by the hydrographer.

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-10807 was completed on June 21, 1998 but not received for office processing until October 26, 1998.

## **Q. AIDS TO NAVIGATION**

One fixed aid to navigation, Letnikof Cove Light 2, falls within the survey area. This aid was adequately positioned and adequately serves the intended purpose. See the hydrographer's report, section Q and Descriptive Report Insert (attached).

There are no floating aids to navigation within the survey limits.

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. Based on the likely continuation of shoaling from Pyramid Cove north to Mc Clellan Flats, the evaluator recommends a note be added on the chart to reflect this situation. Further discussion of this item can be found in the hydrographer's report, section J. Additional information is found in the hydrographer's report, section O.

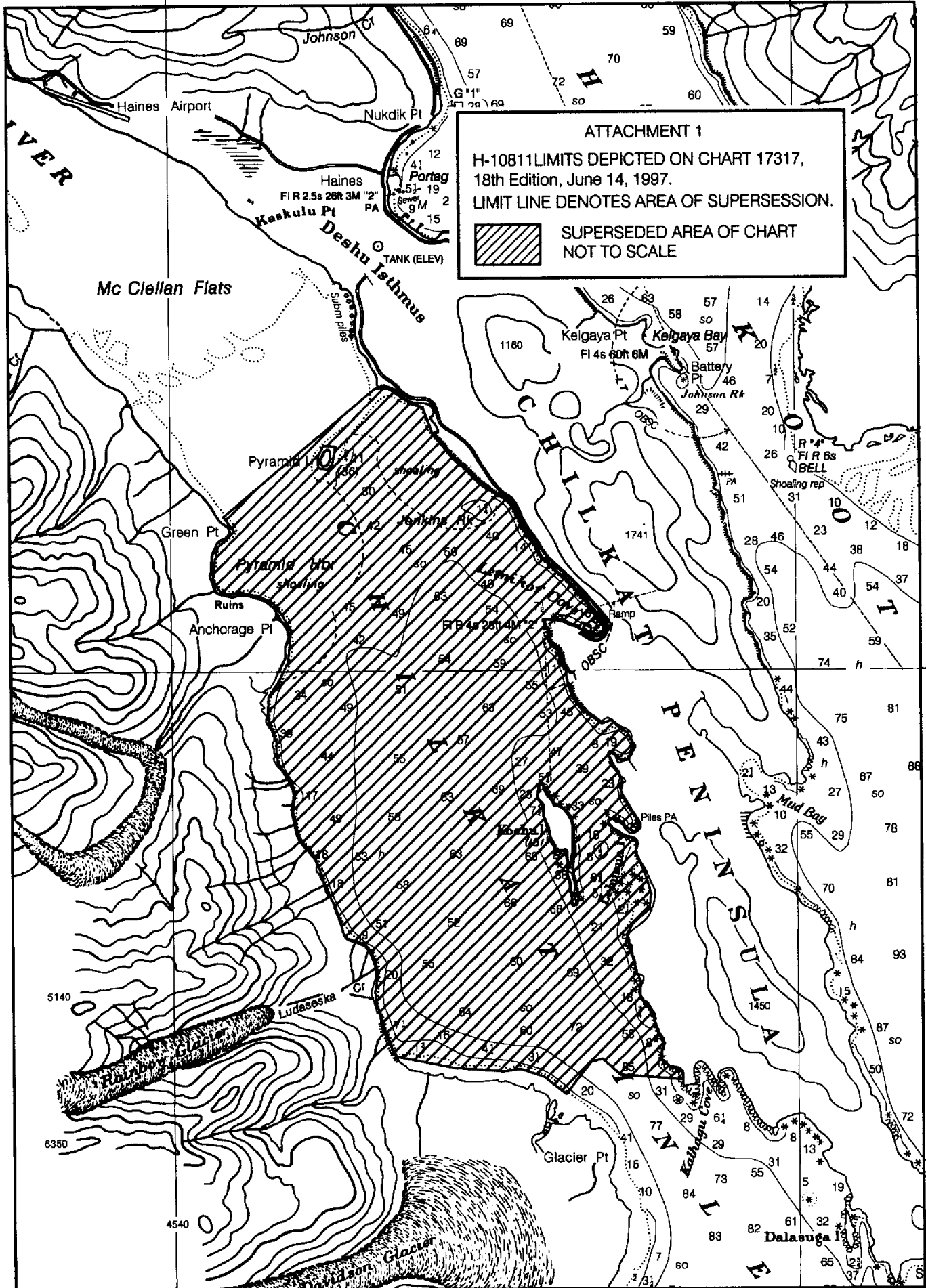
The piers mentioned in the Evaluation Report section P, are recommended for additional work on a low priority basis.

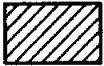
## **U. REFERRAL TO REPORTS**

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



Rick Shipley  
Cartographer



**ATTACHMENT 1**  
 H-10811 LIMITS DEPICTED ON CHART 17317,  
 18th Edition, June 14, 1997.  
 LIMIT LINE DENOTES AREA OF SUPERSESION.  
 SUPERSEDED AREA OF CHART  
 NOT TO SCALE

59/10

APPROVAL SHEET  
H-10811

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.

Bruce A. Olmstead Date: 7/22/99  
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: 7-23-99  
James C. Gardner  
Commander, NOAA  
Chief, Pacific Hydrographic Branch

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Final Approval

Approved:

Samuel P. De Bow Date: August 25, 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-10811

#### 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	7/02/99	Rick Stupley	Full Part <del>Before</del> After Marine Center Approval Signed Via
			Drawing No. <b>FULL APPLICATION OF SOUNDINGS AND</b>
			<b>FEATURES FROM SMOOTH SHEET</b>
			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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