H10737

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-10-6-97

Registry No. H-10737

LOCALITY

State Alaska

General Locality Northern Stephens Passage

Sublocality Vicinity of Arden Point

1997

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

NOAA FORM 77-28 (11-72)

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

REGISTER NO.

H-10737

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.

RA-10-6-97

State Alaska

General locality Northern Stephens Passage

Locality Vicinity of Arden Point

Scale 1:10,000 Date of survey April 5 to April 26, 1997

Instructions dated 12/20/96, Change #1 4/3/97 Project No. OPR-0328-RA

Vessel NOAA Ship RAINIER Launches (2121),(2122),(2123),(2124),(2125),(2126)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by CAPT A. Anderson,LT G.Noll,LT S.LaBossiere,LT M.Larsen,LT S.Lemke, LT K.Bailey,LT D.Baird, ST.S Baum, ST K. Callahan, ST Brown

Soundings taken by echo sounder, ~~hand lead, pole~~ DS 6000N, Knudsen 320M, EG&G Side Scan Sonar

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: R. Davies Automated plot by HP 650C Design Jet

~~Protracted by~~

Verification by R. Davies

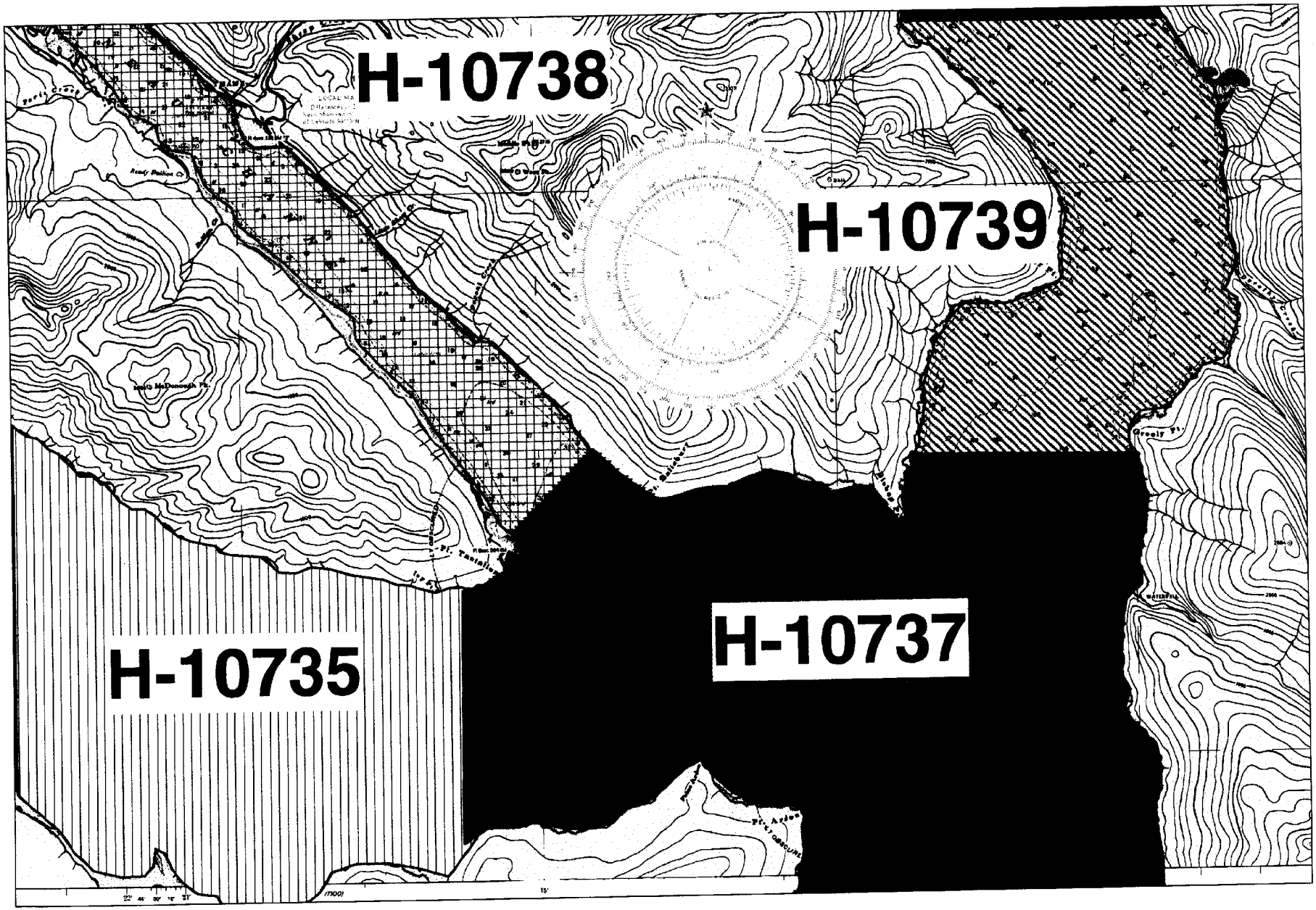
Soundings in fathoms ~~feet~~ at ~~MLW~~ MLLW and tenths

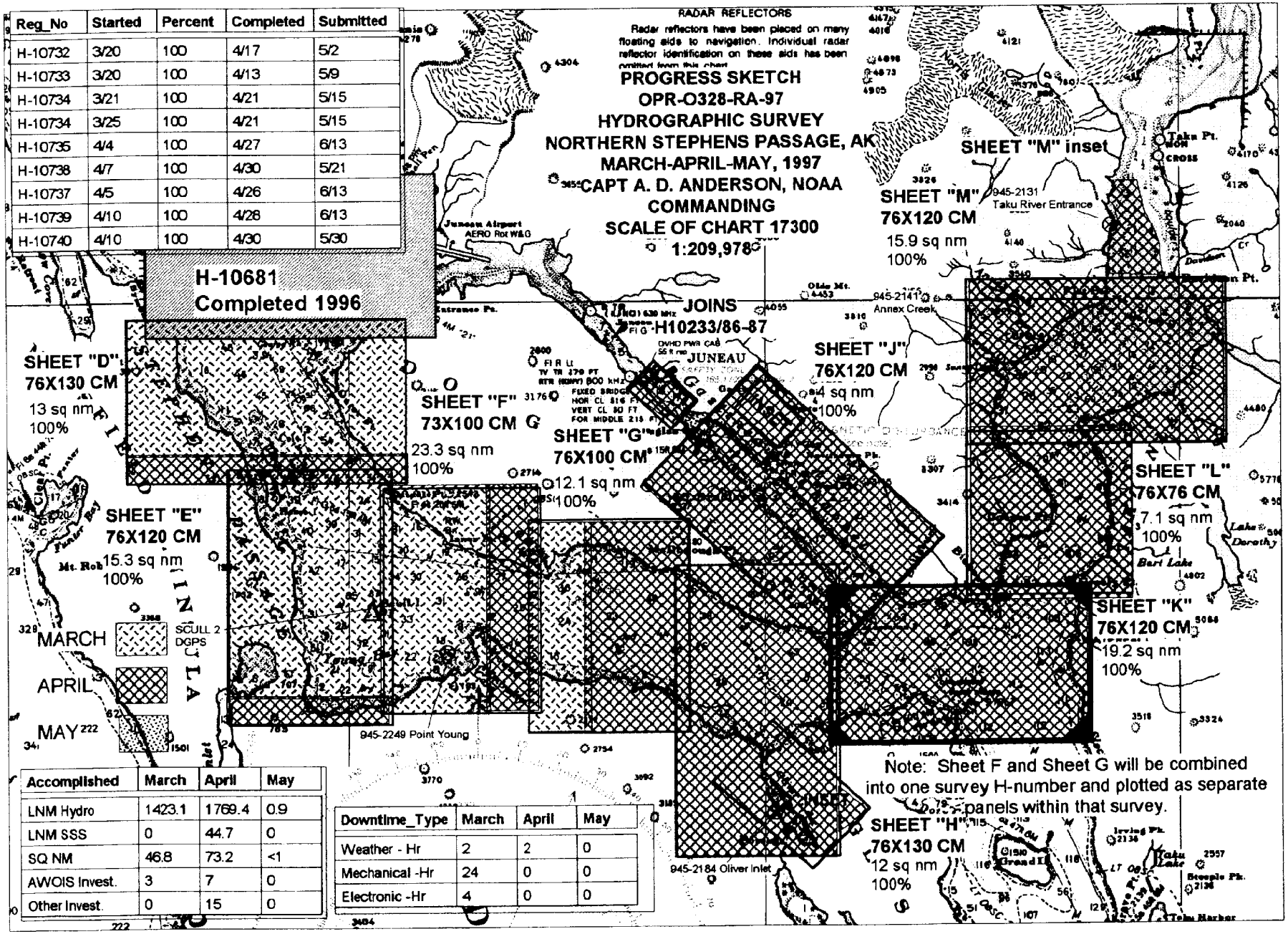
REMARKS: Time in UTC, revision and marginal notes in black were generated during office processing. All separates are filed with the hydrographic data, as a result page numbering may be interrupted or non-sequential.

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

AWOIS + SURF ~ RWD 1/98

U.S. GOVERNMENT PRINTING OFFICE: 1986 - 652-007/41215


H-10738
H-10739
H-10735
H-10737



Reg_No	Started	Percent	Completed	Submitted
H-10732	3/20	100	4/17	5/2
H-10733	3/20	100	4/13	5/9
H-10734	3/21	100	4/21	5/15
H-10734	3/25	100	4/21	5/15
H-10735	4/4	100	4/27	6/13
H-10738	4/7	100	4/30	5/21
H-10737	4/5	100	4/26	6/13
H-10739	4/10	100	4/28	6/13
H-10740	4/10	100	4/30	5/30

Accomplished	March	April	May
LNM Hydro	1423.1	1769.4	0.9
LNM SSS	0	44.7	0
SQ NM	46.8	73.2	<1
AWOIS Invest.	3	7	0
Other Invest.	0	15	0

Downtime_Type	March	April	May
Weather - Hr	2	2	0
Mechanical -Hr	24	0	0
Electronic -Hr	4	0	0

Descriptive Report to Accompany Hydrographic Survey H-10737

Field Number RA-10-6-97
Scale 1:10,000
April 1997
NOAA Ship RAINIER
Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT ✓

This hydrographic survey was completed as specified by Project Instructions OPR-O328-RA dated December 20, 1996, and change number 1 dated April 3, 1997. Survey H-10737 corresponds to sheet K 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 United States Coast Guard (USCG), Southeastern Alaska Pilot's Association (SEAPA), the Alaska Department of Transportation, and the Alaska Department of Environment and Conservation in support of cruise line, commercial fishing, mining, and logging industries.

B. AREA SURVEYED ✓ See Eval Rpt., Section B

The survey area is the vicinity of Point Arden in Northern Stephens Passage. The northern limit of the survey is 58° 12' ~~05~~ 36" N. The southern limit is 58° 08' 40"N. The western limit of the survey is 134° 16' 15" W. The survey is bound by the mainland to the east. Data acquisition was conducted from April 5 to April 26, 1997 (DN 95-116).

C. SURVEY VESSELS ✓

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired and processed using the Hydrographic Data Acquisition and Processing System (HDAPS.) The final field sheet was generated using MapInfo (Version 4.1) and MapBasic software developed by N/CS32 and modified by RAINIER personnel. A complete listing of software for HDAPS is included in Appendix VI.*

E. SONAR EQUIPMENT ✓

Neither Side Scan Sonar or multi-beam echo sounder equipment was used on this survey. Side scan sonar was used to investigate a wD sndg (4 3/4 fm) on DN 111.

F. SOUNDING EQUIPMENT ✓

All launches, except RA-5 as listed below, are equipped with a Raytheon DSF-6000N echo sounder. The Raytheon DSF-6000N is a dual frequency (100 kHz, 24 kHz), paper trace echo sounder. Serial numbers are included on the headers of the daily Raw Master Printouts.* All DSF-6000N soundings were acquired in meters using the High + Low, high frequency digitized setting.

* Filed with the hydrographic data

On DN 111, RA-5 surveyed using a KNUDSEN 320M depth sounder. The KNUDSEN 320M is a dual-frequency thermal depth sounder. The KNUDSEN used the same transducers as the DSN-6000N. This is the first survey Rainier has used the KNUDSEN 320M. The serial number for this unit is K96388.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

One sound velocity cast, Table 9,* was used for this survey. Information on the cast is included in the Survey Information Summary report.*

The sound velocity cast was acquired with SBE SEACAT Profiler (S/N 219), calibrated December 15, 1996. Velocity correctors were computed using the PC programs SEACAT and VELOCITY, version 3.3 (1997), in accordance with Hydrographic Survey Guideline (HSG) No. 69. A printout of the Sound Velocity Corrector Table used in the HDAPS 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 2.2 for vessels 2121-2126 in the spring of 1997. Settlement and squat correctors were computed in accordance with Hydrographic Manual Section 4.9.4.2., using FPM Fig. 2.3, and are included with project data for OPR-O328-RA. The data for vessels 2121, 2122, 2123 were collected in Shilshole Bay, Washington in the spring of 1997; data for vessels 2124 and 2126 were measured in the same location in spring of 1996. The data for 2125 was collected near Scull Island, Alaska in March 1997. All offset tables* contain offsets for the GPS antenna, as well as static draft measurements, and settlement and squat data. Offset tables 1-6 correspond to the last digit of the vessel number. Offset table 7 is for RAINIER. The offset tables are included with project data for OPR-O328-RA. 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). HDAPS 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-10737 are in the Survey Information Summary* included with this report.

Juneau, Alaska (945-2210) and Ketchikan, Alaska (945-0460) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed a Sutron 8200 tide gage at Point Young (945-2249) on March 19, 1997. Refer to the Field Tide Note and supporting data in Appendix V* gauge performance and level closure information. This information has been forwarded to N/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded at the completion of the project to N/OES23. Approved tide note is attached to this report dated September 11, 1997.

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

The horizontal datum for this project is NAD 83. Station SCULL2 on Scull Island was recovered and used as primary hydrographic positioning control for the survey. Station CIRCLE was established on Circle Point as a secondary hydrographic positioning control station. The control stations used for this survey are listed in ~~Appendix III~~ this report. See the OPR-O328-RA-97 Horizontal Control Report for more information.

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

All soundings were positioned using differential GPS. Primary control was the VHF differential reference station at SCULL 2. The US Coast Guard Beacon at GUSTAVUS was used as a backup. 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, SCULL 2 and GUSTAVUS, while the launches were rafted together with their GPS antennae within 2-3 meters of each other. Similar launch-to-launch DGPS performance checks were performed using Station CIRCLE and GUSTAVUS. RAINIER also

* Filed with the hydrographic data

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. SCULL 2 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 SCULL 2. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-O328-RA.

J. SHORELINE ✓ See Eval Rpt., Sections J and M

The shoreline manuscripts from Coastal Mapping survey CM-8904 and CM-8809 were supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital cartographic feature files DM-10046 through DM-10051 and DM-10304 were projected to the survey grid with OPR-O328-RA-97 geodetic parameters using program Shore version 2.0, provided by N/CS32, and plotted on the survey using HDAPS.

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, generally 3-5 meters of depth at Mean Lower Low Water. Features shown on the SHORELINE NOTES layer in the MapInfo workspace inshore of hydrography are the hydrographer's representation of the shoreline while slowly transiting along the shore, and are intended to aid chart compilation. See statement below.
* Rules attached

Shoreline manuscript and field features were compared to an enlargement of chart 17315, plotted at survey scale by RAINIER personnel, and chart 17300. Comparisons to prior surveys T-3849 (1:20,000, 1921), T-4487 (1:10,000, 1929), T-3847 (1:20,000, 1921) and T-6582 (1:10,000, 1937) were also made.

There is general agreement between the charted shoreline and prior surveys and what the hydrographer found on this survey. The survey area is surrounded by steep, rocky shoreline. Many charted rocks did not appear on the shoreline manuscript. The hydrographer believes that the stage of tide of the shoreline manuscript is influential in producing accurate shoreline, especially when applied to limited shoreline verification surveys. Many of the rocks on the shoreline manuscript, especially to the north and east, were found to be the high points of ledges. These ledges are represented in the hydrographer's shoreline and notes. Concur - The shoreline verification and detached position plot were analyzed during office processing and portrayed on the smooth sheet as warranted.

K. CROSSLINES ✓

Crosslines agreed within 1 meter with mainscheme hydrography, except in areas of steep bathymetry. There was a total of 43.58 nautical miles of crosslines, comprising 18.4% of mainscheme hydrography.

L. JUNCTIONS - See EvAL Report, section L

This survey joins with five contemporary surveys. The adjacent surveys are listed below. Soundings between this survey and the five adjacent surveys were found to be in agreement. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum.

Registry #	Scale	Year	Area of Junction
H-10739	1:10,000	1997	Northeast
FE-00432	1:10,000	1997	Southeast
H-10742	1:20,000	1997	South
H-10735	1:10,000	1997	West
H-10738	1:10,000	1997	Northwest

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

Registry #	Scale	Date
H-1920	1:80,000	1888
H-1897	1:80,000	1888
H-4201 WD	1:20,000	1921
H-4964	1:10,000	1929
H-8785	1:10,000	1964

Prior surveys H-1920 (1:80,000, 1888) and H-1897 (1:80,000, 1888) cover the entire area of this survey. H-4964 (1:10,000, 1929) and H-8785 (1:10,000, 1964) cover the eastern portion between Bishop Point and the Eastern Shore. H-4201WD (1:20,000, 1921) is a wire drag survey near Marmion Island, at the entrance to Gastineau Channel.

This survey is in general agreement with the prior surveys. The two prior surveys covering the majority of the area are 1:80,000 scale. Carefully comparison of these surveys show soundings similar to the soundings of this survey. Substantial differences exist in near shore areas between this survey and the charted depths on Chart 17315. (Concur) For example, the charted 41 fm sounding at 58° 09' 32" N and 134° 05' 10" W appears offshore of the sounding position on H-1897. This survey found the depth in that area to be 66.2 - 71.7 fm. This appears to be due to the cartographic representation of the steep bathymetry in these near shore areas. Concur Several charted depths near shore appear to have been portrayed further seaward than shown on the prior survey.

A charted 4 ¾ fm (8.7 m) depth at latitude 58° ~~15' 05"~~ 11' 56" N, longitude 134° ~~11' 56"~~ 15' 05" W originated from H-4021 WD. This was investigated with 5-meter development lines (fixes 50226-50267, DN 111, VN 2125); side scan sonar, and a dive investigation. The side scan sonar investigation included an AWOIS item on H-10738. The data is submitted with that survey. The dive investigation (fix 69697, DN 116) determined the least depth to be 3 1/2 fm (6.2 m) at latitude 58° 11' 56.949" N, longitude 134° 15' 03.890" W. This shoal was reported as a danger to navigation. Concur 3.4 fathom sounding based on approved tides. Chart 3¼ Rk (3 2)

A charted unexploded depth charge in 95 fm (174 m) of water, AWOIS item #52291, originated from a report on November 9, 1962. This item was not verified during this survey. It should be retained as charted. Item plots in present survey depths of 100 - 105 fathoms.

N. ITEM INVESTIGATIONS See Eval Rpt., Section N.

One unassigned AWOIS item, #52291 (information) Unexploded Depth Charge, ~~was located~~ is charted within H-10737 survey area. No indication of the item was found during main scheme hydrography. Main scheme hydrography was conducted at 200 meter line spacing.

Charting Recommendations

The hydrographer recommends that the unexploded ordinance designation be removed from the chart. It is in 570 feet of water and has no navigational significance. It clutters the chart. Do not concur, retain as charted.

O. COMPARISON WITH THE CHART See Eval Rpt., Section O.

Charts 17315, 1:40,000, 21st Edition, 8/3/91 and 17300, 1:209,978, 27th Edition, 8/14/93 are the largest scale charts covering the survey area. Comparison of soundings is described in Section M. Non-sounding features are discussed in Section J. Final sounding comparisons will be made at PHB after reduction to final vertical datum.

Dangers to Navigation

The least depth determination of 3 1/2 fm (6.2 m) on a rock ridge off Marmion Island Light has been determined to be a Danger to Navigation.

This Danger to Navigation was reported to the USCG District 17 headquarters in Juneau, Alaska, on May 22, 1997. The depth was reported to be 3 1/2 fm. ~~The hydrographer determined that the difference was not significant to traffic that would be transiting this area, thus a new Notice to Mariner was not produced.~~ The DTON letter is attached to this report.

P. ADEQUACY OF SURVEY ✓

Survey H-10737 is complete and adequate to supersede prior charted soundings and features in their common areas, except for Awois ITEM# 52291, Unexploded Depth Charge.

Q. AIDS TO NAVIGATION ✓

Point Arden light was positioned using static GPS methods from station Twin Point. See the attached Section Q insert for detailed comparison of this position to the charted and Light List positions. The position was also sent to the Aids to Navigation office at USCG District 17 headquarters in Juneau, Alaska.

Marmion Island light was positioned from SCULL2 with other Gastineau Channel lights and is included on survey H-10738, 1997. Marmion Island Light has also been shown on H-10737.

R. STATISTICS ✓

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

S. MISCELLANEOUS ✓

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

No unusual tidal currents or magnetic variations were found during this survey.

Secchi disk observations were not conducted on this survey due to the lack of visibility from plankton blooms.

T. RECOMMENDATIONS ✓

The hydrographer recommends removal of the wire drag green tint from the charts common to this survey. The wire drag tint without wire depth now confuses the mariner with non-bathymetric information. This information was useful when most soundings were derived from sparse leadline surveys. Modern surveys such as this one supersede wire drag clearances and hangs, prior survey soundings, and features seaward of the launch navigational limit by investigating, with high-percentage echosounder coverage, diver, side scan or visual investigation, all shoals and features that may pose a hazard to navigation.

Side Scan was only used to investigate the charted 4 3/4 depth originating from H-4021 WD discussed in Section M. Concur

U. REFERRAL TO REPORTS ✓

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

Title	Date Sent	Office
OPR-O328-RA Horizontal Control Report	May 1997	N/CS34

* Filed with the hydrographic data

Respectfully Submitted,

Kimberly C. Bailey
Lieutenant, NOAA

Approved and Forwarded,

Alan D. Anderson
Captain, NOAA
Commanding Officer

CONTROL STATIONS as of 24 Apr 1997 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel	Code	MM/DD/YY	Station Name
1	F	058:31:42.000	134:56:00.000	0	0	0.0	0.0		03/01/92	POUNDSTONE LIGHTLIST
2	F	058:31:42.860	134:56:03.680	0	0	0.0	0.0		03/01/92	POUNDSTONE HOAPS
3	F	058:30:16.042	134:52:09.349	2	250	0.0	0.0		03/20/96	GULL
4	F	058:17:04.466	134:44:25.552	0	0	0.0	0.0		04/05/97	COLT ISLAND LT LL#23792
5	F	058:18:55.499	134:42:02.285	0	0	0.0	0.0		04/05/97	GEORGE RK LT LL#23795
6	F	058:25:06.000	135:41:48.000	0	250	0.0	0.0		03/01/97	GUSTAVUS DGPR ID#892
7	F	058:12:16.867	134:38:44.450	6	250	0.0	0.0		03/01/97	SKULL DGPS
~~8~~	F	058:~~07:29.640~~	134:10:~~36.025~~	0	0	0.0	0.0		03/01/97	PT. ARDEN LT LL#23655
9	F	058:07:12.193	134:04:56.697	0	250	0.0	0.0		03/01/97	CIRCLE DGPS

* 058:09: 33.336 134:10: 40.03

NOAA FORM 76-40
(8-74)

Repalces C&GS Form 567

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

ORIGINATING ACTIVITY
- [x] HYDROGRAPHIC PARTY
- [ ] GEODETIC PARTY
- [ ] PHOTO FIELD PARTY
- [ ] COMPILATION ACTIVITY
- [ ] FINAL REVIEWER
- [ ] QUALITY CONTROL & REVIEW GRP.
- [ ] COAST PILOT BRANCH

(See reverse for responsible personnel)

- [ ] TO BE CHARTED
- [x] TO BE REVISED
- [ ] TO BE DELETED

REPORTING UNIT (Field Party, Ship or Office)	STATE	LOCALITY	DATE
RAINIER	ALASKA	Vicity of Point Arden Northern Stephens Passage	15-Apr-97

The following objects HAVE ☐ HAVE NOT ☐ *been inspected from seaward to determine their value as landmarks.*

OPR PROJECT NO.	JOB NUMBER	SURVEY NUMBER	DATUM
OPR-0328-RA		H-10737	NAD83

CHARTING NAME	DESCRIPTION (Record reason for deletion of landmark or aid to navigation. Show triangulation station names, where applicable, in parentheses)	POSITION LATITUDE ° ′	LATITUDE ″ D.M. Meters	POSITION LONGITUDE ° ′	LONGITUDE ″ D.P. Meters	METHOD AND DATE OF LOCATION (See instructions on reverse side) OFFICE	FIELD	CHARTS AFFECTED
L.L# 23655	Point Arden Light Fl W 4s	58 09	33.3 (33.6) 1030	134 10 (06)	40.9 (91.3) 669		F-GPS-L 4/15/97	17300 17315 17316

RESPONSIBLE PERSONNEL		
TYPE OF ACTION	**NAME**	**ORIGINATOR**
OBJECTS INSPECTED FROM SEAWARD		☐ PHOTO FIELD PARTY ☒ HYDROGRAPHIC PARTY ☐ GEODETIC PARTY ☐ OTHER
POSITIONS DETERMINED AND/OR VERIFIED	Capt. A. D. Anderson	FIELD ACTIVITY REPRESENTATIVE OFFICE ACTIVITY REPRESENTATIVE
FORMS ORIGINATED BY QUALITY CONTROL AND REVIEW GROUP AND FINAL REVIEW		☐ REVIEWER ☐ QUALITY CONTROL AND REVIEW GROUP REPRESENTATIVE

INSTRUCTIONS FOR ENTRIES UNDER 'METHOD AND DATE OF LOCATION'

(Consult Photogrammetric Instructions No. 64)

OFFICE

1. OFFICE IDENTIFIED AND LOCATED OBJECTS

   Enter the number and date (including month, day, and year) of the photograph used to identify and locate the object.

   EXAMPLE: 75E (C) 6042
   8 - 12 - 75

FIELD

1. NEW POSITION DETERMINED OR VERIFIED

   Enter the applicable data by symbols as follows:

   F - Field — P - Photogrammetric
   L - Located — Vis - Visually
   V - Verified
   1 - Triangulation — 5 - Field identified
   2 - Traverse — 6 - Theodolite
   3 - Intersection — 7 - Planetable
   4 - Resection — 8 - Sextant

   A. Field positions* require entry of method of location and date of field work.

   EXAMPLE: F - 2 - 6 - L
   8 - 12 - 75

*FIELD POSITIONS are determined by field observations based entirely upon ground survey methods.

FIELD (Cont.)

B. Photogrammetric field positions** require entry of method of location or verification, date of field work and number of the photograph used to locate or identify the object.

EXAMPLE: P - 8 - V
8 - 12 - 75
74L (C) 2982

II. TRIANGULATION STATION RECOVERED

When a landmark or aid which is also a triangulation station is recovered, enter 'Triang. Rec.' with date of recovery.

EXAMPLE: Triang. Rec.
8 - 12 - 75

III. POSITION VERIFIED VISUALLY ON PHOTOGRAPH

Enter 'V-Vis.' and date.

EXAMPLE: V-Vis.
8 - 12 - 75

**PHOTOGRAMMETRIC FIELD POSITIONS are dependent entirely, or in part, upon control established by photogrammetric methods.

NOAA FORM 76-40 (8-74)

SUPERSEDES NOAA FROM 76-40 (2-71) WHICH IS OBSOLETE, AND EXISTING STOCK SHOULD BE DESTROYED UPON RECEIPT OF REVISION.

☆ U. S. GPO : 1975-0-665-080/1155

Section Q: Descriptive Report Insert

Name of Aid: Point Arden Light

Light List #: 23655

Method of Positioning: DGPS

Positioning Info

	Latitude N	Longitude W
Charted Pos.	58° 09' 35"	134° 10' 38"
Survey Pos.	58° 09' 32.3364"	134° 10' 40.9138"

Difference between Survey/Charted position: 93.87 meters at 204 ° T

Characteristics

Do Characteristics Match Light List? (y/n) **YES**

Does aid adequately serve its apparent purpose? **YES**

Light List #	Light Name	Geographic Position	
23645	Grave Point Light	58° 03' 43.91993" N 134° 03' 04.29002" W	Not within Survey limits
23650	Grand Island Light	58° 05' 58.07491" N 134° 06' 27.71658" W	" "
23655	Point Arden Light ✓	58° 09' 33.33684" N 134° 10' 40.91384" W	
23660	Marmion Island Light ✓	58° 11' 54.96776" N 134° 15' 24.05043" W	
23665	Sheep Creek Light 2	58° 15' 28.42070" N 134° 19' 51.99793" W	Not within Survey limits
23675	Juneau Isle Light	58° 16' 34.62499" N 134° 23' 03.88963" W	" "
23680	Douglas Boat Harbor Light 1D	58° 16' 35.05400" N 134° 23' 14.30118" W	" "
23690	Lawson Creek Bar Light 3	58° 17' 16.56210" N 134° 24' 25.84606" W	" "
23695	- Light 4	58° 17' 49.17172" N 134° 25' 21.75373" W	" "
23775	Point Hilda Light	58° 13' 01.81231" N 134° 30' 23.17270" W	" "
23780	Inner Point Daybeacon	58° 13' 51.54721" N 134° 35' 21.84257" W	" "
23785	Middle Point Light	58° 14' 53.56772" N 134° 37' 43.56840" W	" "
23790	Horse Shoal Light 1	58° 15' 15.88126" N 134° 42' 10.74649" W	Not within Survey limits
23792	Colt Island Light	58° 17' 04.47532" N 134° 44' 25.50430" W	" "
23795	George Rock Light	58° 18' 55.49907" N 134° 42' 02.28463" W	" "
24112	Hawk Inlet Range Front Light	58° 05' 06.97625" N 134° 46' 27.17407" W	" "
24113	- Range Rear Light	58° 04' 55.15472" N 134° 46' 26.52906" W	" "
24114	Light 6	58° 05' 56.95615" N 134° 46' 23.34618" W	" "
24115	- East Shoal Light 8	58° 06' 11.83946" N 134° 46' 22.36006" W	" "
24117	- Entrance Light	58° 06' 31.87726" N 134° 46' 30.96867 " W	" "

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

NOAA Ship RAINIER
May 22, 1997

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

ADVANCE INFORMATION

Dear Sir:

A danger to navigation has been discovered by NOAA SHIP RAINIER while conducting hydrographic survey H-10737 in Northern Stephens Passage. This danger affects the following charts:

Number	Edition	Date	Scale	Datum
17300	27TH ED.	93/08	1:209,978	NAD 83
17315	21ST ED.	91/08	1:40,000	NAD 83

It is recommended that this danger to navigation be included in the Local Notice to Mariners. A chartlet showing the position of this danger relative to other hydrographic features at the largest charted scale is enclosed along with a listing of the position and depth.

~~NOAA Ship RAINIER performed a side scan sonar and echosounder investigation of a shoal reported in August 1996 in the vicinity of Indian Rock, near Haines, Alaska. Least depth was found at 59/16/07.0N, 135/23/14.0W of 10 3/4 fathoms at Mean Lower Low Water. No other shoals exist within 1/4 nautical mile radius of this position. Refer to the enclosed 1:80,000 scale 17617 chartlet of the area.~~ Does not pertain to survey H-10737

The letter of May 15 listing the Third Order Class I positions of navigational aids in the Juneau area contained inaccurate positions; these have been corrected in the attached listing.

Questions concerning this report should be directed to the Pacific Hydrographic Branch at (206) 526-6835.

Sincerely,

Alan D. Anderson
Captain, NOAA
Commanding Officer

Enclosures
Attachment

cc: NIMA
PMC
N/CS34

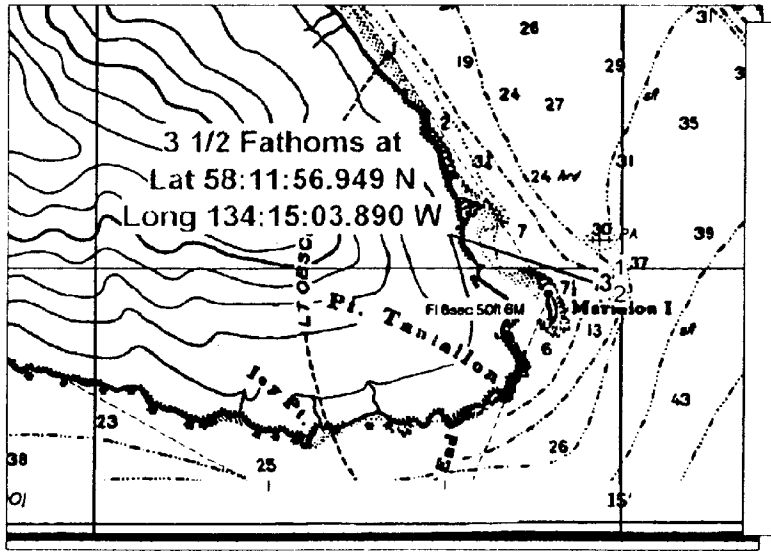


Chart 17315, 21st Edition
August 3, 1991
Scale 1:40,000
Soundings in Fathoms and Quarters
(at Mean Lower Low Water)
H-10737, May 22, 1997
Project OPR-O328-RA-97

NOAA SHIP RAINIER
CAPTAIN ALAN D. ANDERSON
COMMANDING OFFICER

ADVANCE INFORMATION

ADVANCE
INFORMATION

DANGERS TO NAVIGATION

OPR-O328-97 NORTHERN STEPHENS PASSAGE

MESSAGE #: RA-03-1997

REGISTRY NUMBER H-10737

LOCALITY VICINITY OF POINT ARDEN

AFFECTED CHARTS:

CHART	EDITION NUMBER	DATE	SCALE
17315	21 ST ED.	91/08	1:40,000
17300	27 TH ED.	93/08	1:209,978

ITEM	DANGER	DEPTH	LATITUDE (N)	LONGITUDE (W)
A	ROCK	3 1/2 fm	058:11:56.~~949~~	134:15:03.890

Limited Shoreline Verification: The New Rules

First, understand that the fundamental difference between last year and this year is that the amount of shoreline we must verify is determined by US, not strictly specified in the Project Instructions.

Procedures:

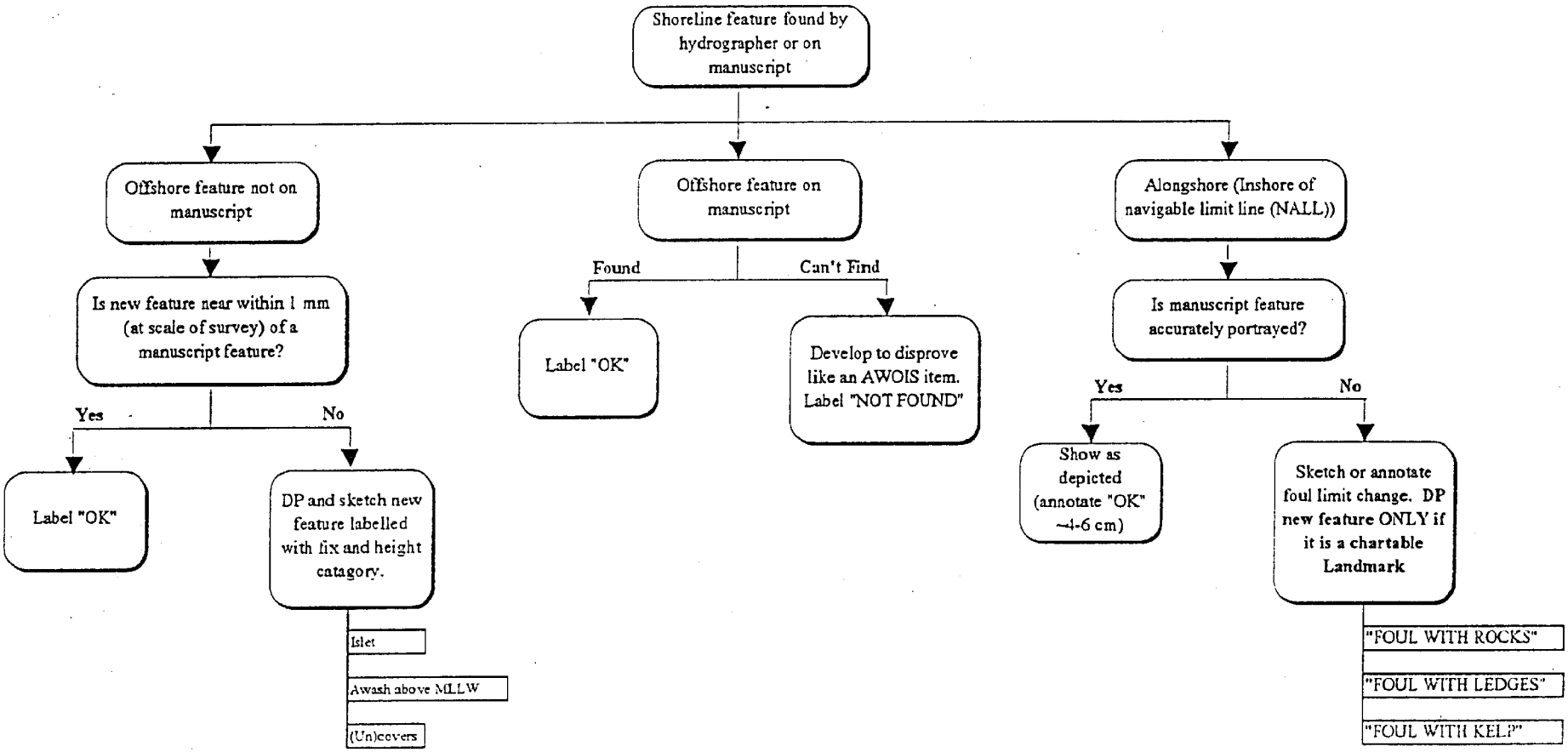
1) Determine distance from shore that is the MINIMUM working distance necessary for the survey. Take into account likely vessel traffic, bathymetry, complexity of the shoreline from prior surveys and the chart, and weather (sea) conditions experienced in the area. Use greater distances if shallow depths prevail, or if swell is severe. Even in steep foreshore bathymetry, do not go closer than 3 launch lengths (30 meters), unless vessel usage indicates that the area is used (e.g. a landing ramp is on shore, or an extremely narrow passage is used by fishing vessels to reach a certain bay.)

2) Draw the inshore limit determined in (1) on the boat sheet. Collecting data along this line may or may not be feasible, due to tides and project logistics, but the boat sheet line may be used to delimit mainscheme and development hydrography until such a "buffer" line is or may be needed.

3) Search for and develop all features seaward of the line drawn in (2). Use low water for this search, if possible. Combining this search with the acquisition of the data along the "buffer" line may be possible in areas which are not too complex. Detached positions are required only if a feature is found offshore of the NALL line and either more than 1 mm away from any manuscript feature or is mis-represented by the manuscript. If a charted or manuscript feature located offshore of the line is NOT found, a full disproval is required.

4) Annotate the field copies of the boat sheet (which by definition includes the charted, manuscript, and significant prior survey features) showing that the shoreline features offshore of the NALL each have a full disposition. These copies are bound and used to create the final field sheet, and submitted as official survey records.

Shoreline Decision Tree



Prepared by Mark S. Larsen

APPROVAL SHEET

FOR

H-10737

RA-10-06-97

Standard procedures were followed in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Guidelines; and the 1994 version of the Field Procedures Manual in producing this survey. The data were examined daily during data acquisition and processing.

The field sheet and accompanying records have been examined by me, are considered complete and adequate for charting purposes, and are approved.

Alan D. Anderson

Alan D. Anderson
Captain, NOAA
Commanding Officer

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Ocean and Earth Sciences
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: September 11, 1997

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-0328-RA
HYDROGRAPHIC SHEET: H-10737

LOCALITY: Northern Stephens Passage, AK. (Sheet K)

TIME PERIOD: April 5 - April 26, 1997

TIDE STATION USED: 945-2249 Young Bay, AK.
Lat. 58° 11.0'N Lon. 134° 35.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.690 meters

TIDE STATION USED: 945-2210 Juneau, AK.
Lat. 58° 17.9'N Lon. 134° 24.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.674 meters

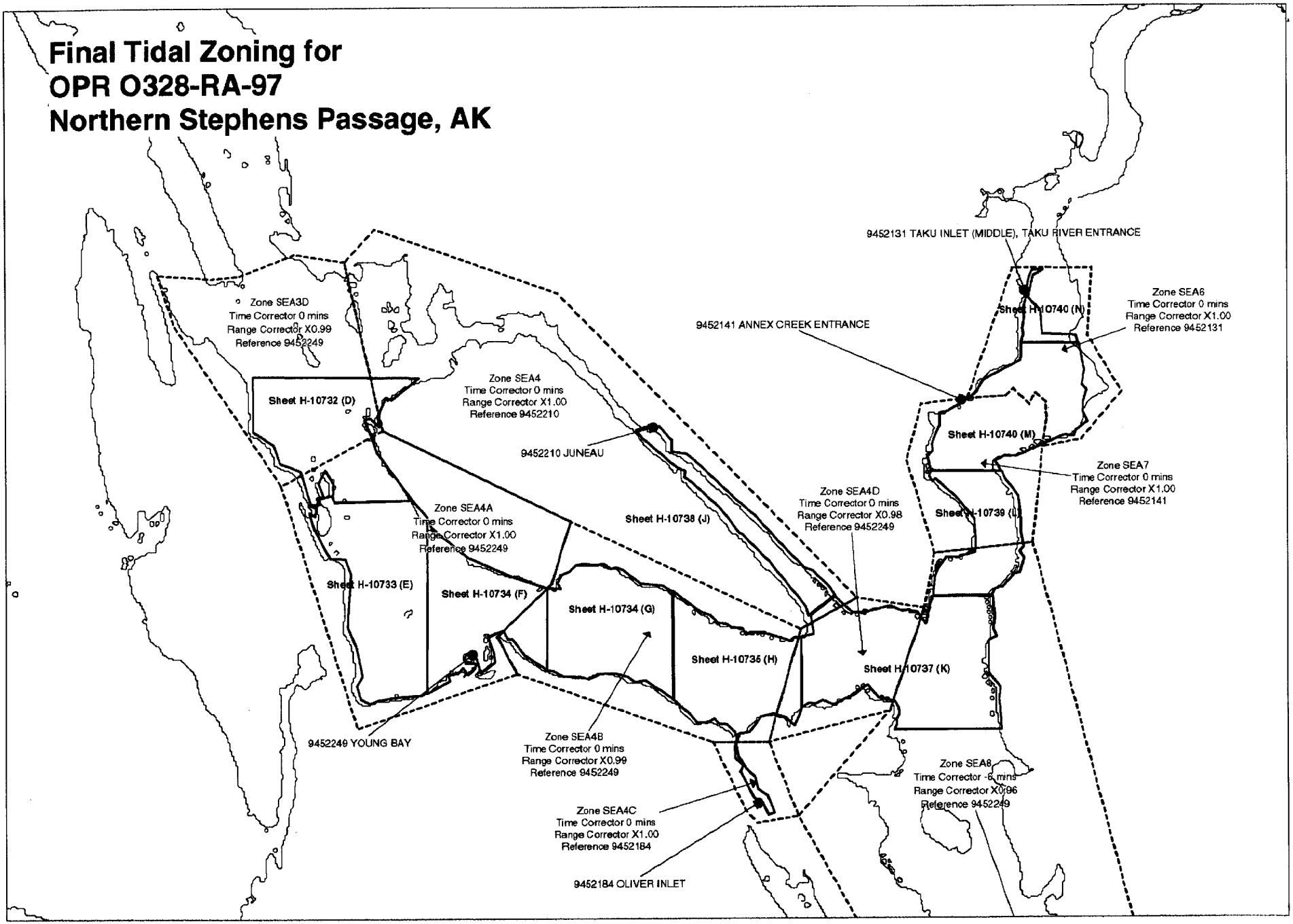
REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: SEA4, SEA4D & SEA8
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time.

Note 2:
Juneau, AK was used as control for datum determination for all subordinate tide stations for this survey. Relative sea level trends show that the areas of Juneau Alaska are undergoing continual uplift. The relative sea level trend observed at Juneau for the time period 1950 through 1993 is -0.0114 m/yr. with a standard error of 0.0005 m/yr. As a result of high rate of sea level change, the 1960 to 1978 Tidal Epoch value of Mean Lower Low Water (MLLW) used as chart datum and reference datum for NOS tidal predictions does not reflect present conditions. The data are under review to determine an updated value of MLLW. An interim value was computed for Juneau, based on the series of data from 1989 to 1991 and controlled by the 1960-1978 Epoch datums at Ketchikan which is more stable. The provided values adjust the chart datum to a more realistic level and in a direction that is more conservative for navigation purposes.

CHIEF, TIDAL ANALYSIS BRANCH

Final Tidal Zoning for
OPR O328-RA-97
Northern Stephens Passage, AK



Final tide zone node point locations for OPR O328-RA-97,
Sheet H-10737 (K).

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 SEA4			
-134.269583 58.196589	945-2210	0	1.00
-134.215162 58.212147			
-134.504596 58.366223			
-134.681627 58.398836			
-134.710781 58.382241			
-134.673853 58.297194			
-134.49203 58.251071			
-134.269583 58.196589			
Zone SEA4D			
-134.15 58.207113	945-2249	0	0.98
-134.215162 58.212147	945-2210	0	0.98
-134.269583 58.196589			
-134.300514 58.139749			
-134.183573 58.155284			
-134.15 58.207113			
Zone SEA8			
-134.04478 58.239803	945-2249	-6	0.96
-133.929274 58.010814	945-2210	0	0.97
-133.765896 57.91308			
-133.663784 57.798637			
-133.629746 57.702608			
-133.917108 57.704177			
-134.080082 57.896614			
-134.132552 57.972586			
-134.272032 58.10242			
-134.183573 58.155284			
-134.15 58.207113			
-134.140172 58.234618			
-134.04478 58.239803			

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10737

Name on Survey	A ON CHART NO. 17315, 17300	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H	K U.S. LIGHT LIST	
ALASKA (title)	X		X							1
ARDEN POINT	X		X							2
BISHOP POINT	X		X							3
DOUGLAS ISLAND	X		X							4
FALSE ARDEN (cape)	X		X							5
MARMION ISLAND	X		X							6
SALISBURY, POINT	X		X							7
SOUTHEAST END	X		X							8
STEPHENS PASSAGE	X		X							9
TANTALLON POINT	X		X							10
										11
										12
										13
										14
										15
										16
										17
										18
					Approved:					19
					Curtis E. Lay					20
					Chief Geographer					21
					AUG 7 1997					22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

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

U.S. DEPARTMENT OF COMMERCE

HYDROGRAPHIC SURVEY STATISTICS

REGISTRY NUMBER: H-10737

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	SMOOTH OVERLAYS: POS., ARC, EXCESS	
DESCRIPTIVE REPORT	1	FIELD SHEETS AND OTHER OVERLAYS	

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

SHORELINE DATA

SHORELINE MAPS (List):	DM-10051, DM-10046, DM-10304
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	Chart 17315 21st Ed., August 3, 1991

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS VERIFICATION	AMOUNTS EVALUATION	AMOUNTS TOTALS
POSITIONS ON SHEET			
POSITIONS REVISED			
SOUNDINGS REVISED			
CONTROL STATIONS REVISED			

	TIME-HOURS VERIFICATION	TIME-HOURS EVALUATION	TIME-HOURS 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	61		61
COMPARISON WITH PRIOR SURVEYS AND CHARTS			
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		20	20
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS — TOTALS	61	20	81

Pre-processing Examination by M. Bigelow	*Beginning Date* 9/25/97	*Ending Date* 9/30/97
Verification of Field Data by R. Mayor, R. Davies	*Time (Hours)* 61	*Ending Date* 10/2/97
Verification Check by B. Olmstead	*Time (Hours)* 3	*Ending Date* 10/23/97
Evaluation and Analysis by R. Davies	*Time (Hours)* 20	*Ending Date* 10/9/97
Inspection by B. Olmstead	*Time (Hours)* 8	*Ending Date* 10/29/97

EVALUATION REPORT

H-10737

A. PROJECT

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

B. AREA SURVEYED

An adequate discussion of the survey area is found in the hydrographer's report.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line 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 limits of supersession accompanies this report as Attachment 1.

The bottom consists mainly of green mud. Green silt was also prevalent. Fine broken shells and broken shingles were common components throughout the sampling area. Depths range from zero to 116 fathoms.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data were processed using the same Hydrographic Data Acquisition/Processing System (HDAPS) software used by the hydrographer, the Hydrographic Processing System (HPS), and MicroStation 95.

At the time of the survey certification the format for transmission of digital data had not been formally approved. In the interim, digital data for this survey exists in the standard HPS format that is a database format using the .dbf extension. In addition, the plot is filed both in the AutoCad drawing format, i.e., dwg (extension), and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data transfer protocols are developed and approved.

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 field sheet parameters have been revised to center the hydrography on the office plot. The data is plotted using a Modified Transverse Mercator projection and are depicted on a single sheet.

E. SONAR EQUIPMENT

Side Scan Sonar equipment was used on survey H-10737. The data can be found in the raw survey records for survey H-10738.

F. SOUNDING EQUIPMENT

The hydrographer's report contains a discussion on sounding equipment.

G. CORRECTIONS TO SOUNDINGS

The sounding data 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 approved hourly heights zoned direct from the following tide gages: Young Bay, Alaska and Juneau, Alaska, gages 945-2249 and 945-2210.

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:	-1.185 seconds	(-36.654 meters)
Longitude:	6.320 seconds	(103.304 meters)

The year of establishment of control stations originate with the horizontal control records for this survey.

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 horizontal dilution of precision (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.

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

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

J. SHORELINE

Shoreline maps DM-10304, DM-10046 and DM-10051, scale 1:20,000 were compiled on NAD 83 and apply to this survey. Shoreline drawn on the smooth sheet originates from 1:20,000 scale digital files provided by the Coastal Mapping Program. The digitized files and the survey file were merged during MicroStation processing.

There were no MHW revisions on this survey.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10737 junctions with the following surveys:

Survey	Year	Scale	Area
H-10735	1997	1:10,000	West
H-10738	1997	1:10,000	Northwest
H-10739	1997	1:10,000	Northeast
H-10742	1997	1:20,000	South
F00432	1997	1:10,000	Southwest

The junction with surveys H-10735, H-10738 and H-10739 are complete; soundings and depth curves are in good agreement within the common area. A "Joins" note has been shown on the survey.

The junction with surveys H-10742 and F00432 were not formally completed since these surveys are in office processing. There is good agreement between depth curves and sounding within the common area between this survey and the final field sheets. An adjoins has been shown on this survey for the above surveys.

M. COMPARISON WITH PRIOR SURVEYS

H-1897(1888)	1:80,000
H-1920(1888)	1:80,000
H-2058(1890)	1:20,000
H-4147(1921)	1:40,000
H-4771(1927)	1:10,000
H-4964(1929)	1:10,000
H-8785(1964)	1:10,000

The above prior surveys cover the entire area of the present survey. There is no consistent pattern in the depth changes between the prior surveys and the present survey. Differences in depths range between 2 to 5 fathoms. These differences may be attributed to greater sounding coverage, improved positioning and sounding methods and relative accuracy of the data acquisition techniques.

Survey H-10737 is adequate to supersede the above prior surveys within the common area.

T-3847(1921)	1:20,000
T-3849(1921)	1:20,000
T-4487(1929)	1:10,000
T-6582(1937)	1:10,000

Prior shoreline maps cover the entire area common to survey H-10737. The shoreline has remained relatively stable and survey H-10737 compares very well with the prior's shoreline maps.

Survey H-10737 is adequate to supersede the prior shoreline maps within the common area.

H-4201WD(1921)	1:20,000
H-4147aWD(1921)	1:40,000
H-4147(1921)	1:40,000

The above wire-drag surveys cover the entire area of the present survey. All wire-drag soundings and clearance depths were investigated. Adequate sounding development was accomplished to remove the 4 ¾ fathoms (29ft) depth charted at 58/11/56N, longitude 134/15/05W. The 51 fathom (306ft) depth charted at latitude 58/09/32N, longitude 134/10/00W originates as a leadline depth from H-4147a WD(1921). Although the prior 51-fathom leadline depth was not adequately developed, bottom coverage in the area revealed no significant changes in bottom relief. Depths on the present survey are generally 103-112 fathoms with no indication of significant shoaling. The present survey found similar depths approximately 300 hundred meters west of the charted 51-fathom sounding. The evaluator recommends the prior sounding be removed from the chart based on either an erroneous leadline measurement and or incorrect positioning.

Survey H-10737 is adequate to supersede the prior wire-drag surveys within the common area.

N. ITEM INVESTIGATIONS

AWOIS item #52276, submerged wreck, falls within the present survey area. However, it was found during survey operations on survey H-10738, a junctional survey located on the northwestern boundary of the present survey. This item does not plot within the survey limits of the present survey and has been addressed in the descriptive report for H-10738. Refer to H-10738 for graphic portrayal of this feature.

One unassigned AWOIS item (informational), #52291, an unexploded depth charge, charted in 570 feet of water was not investigated by the hydrographer and should be retained as charted.

O. COMPARISON WITH CHART

Survey H-10737 was compared with the following charts:

Chart	Edition	Date	Scale	Datum
17300	27th	Aug. 14, 1993	1:209,978	NAD83
17315	21st	Aug. 3, 1991	1:40,000	NAD83

a. Hydrography

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

The charted green tint represents wire-drag areas from surveys conducted in 1917 – 1922. The evaluator recommends removing the charted green tint based on more modern data acquisition techniques.

Except for AWOIS item 52291, survey H-10737 is adequate to supersede charted hydrography within the charted area.

b. Dangers To Navigation

One danger to navigation was discovered during survey operations and reported to the USCG on May 22, 1997. A copy of this report is attached. No additional dangers to navigation were found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10737 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 1994 Edition.

Q. AIDS TO NAVIGATION

Two fixed aids to navigation exist within the survey area. Point Arden Light and Marmion Island Light was located during survey operations and adequately marks the features intended. Additional information can be found in section Q of the hydrographer's report and on NOAA Form 76-40 which is attached to the hydrographer's report. The NOAA Form 76-40 for Marmion Point Light can be found in the descriptive report for survey H-10738.

There were no floating aids to navigation and no features of landmark value located within the area of this survey.

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

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

T. RECOMMENDATIONS

This is a good hydrographic survey. Additional work is recommended on a low priority basis to verify or disprove AWOIS item 52291.

U. REFERRAL TO REPORTS

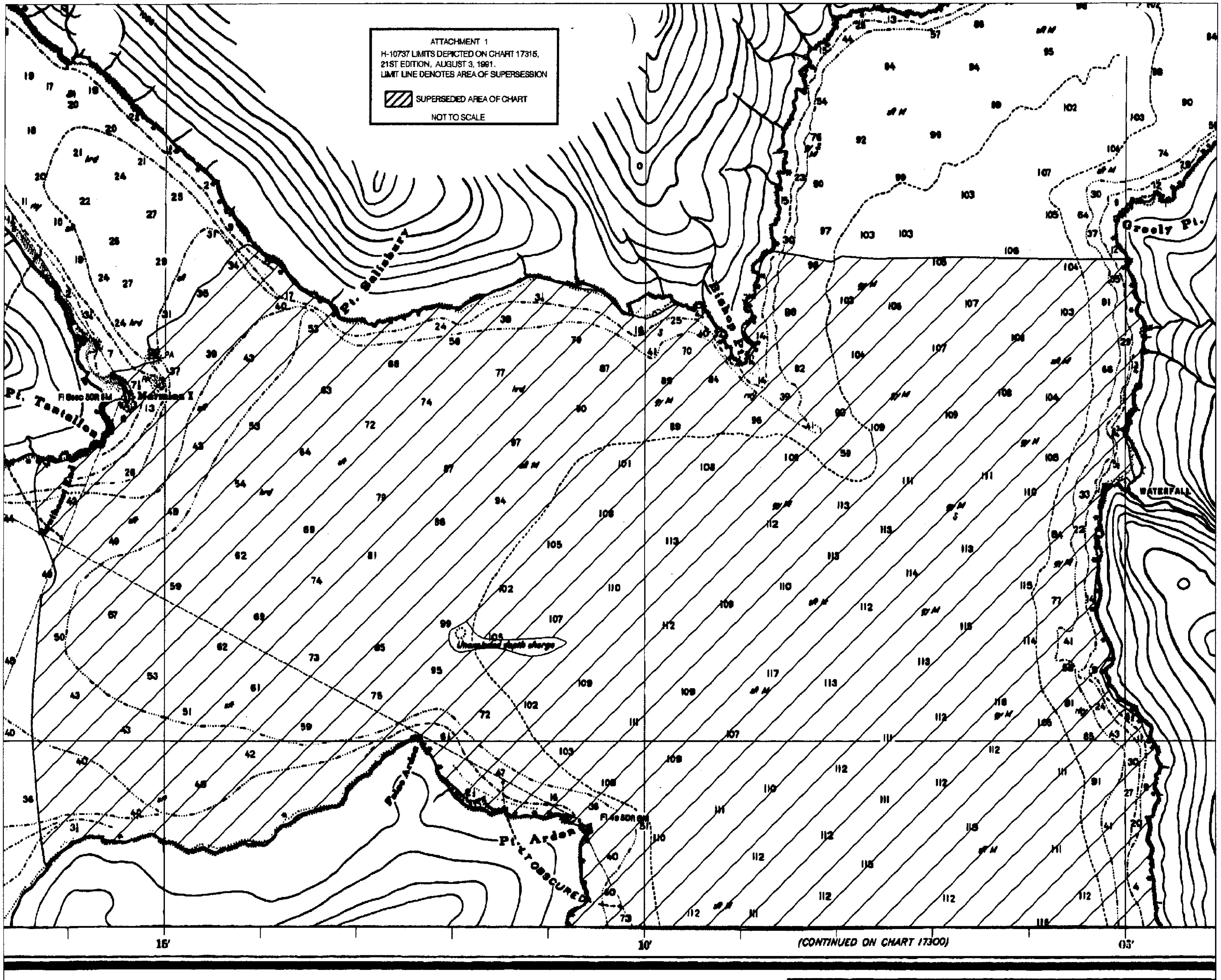
Referral to reports is discussed in the hydrographer's report.

Charles R. Davies

C. R. Davies
Cartographer

Numerous charted rocks awash along shoreline from H-10737 originate from ledge as shown on the smooth sheet.

G. K. Myers
1-8-98



c:\h-10737\chart\17315h10.737 Oct 07 1997 11:22:09

APPROVAL SHEET
H-10737

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: 11/5/97
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.

Kathy Timmons Date: 11/10/97
Kathy Timmons
Commander, NOAA
Chief, Pacific Hydrographic Branch

****

Final Approval

Approved:

Andrew A. Armstrong III Date: Jan 8, 1998
Andrew A. Armstrong III
Captain, NOAA
Chief Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10737

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
17315	10/6/97	Russ Davis	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via Full Application of
			Drawing No. soundings and curves from smooth sheet
17300	12/04/97	Russ Davis	Full ~~Part~~ ~~Before~~ After Marine Center Approval Signed Via Examined, no
			Drawing No. corrections and soundings applied.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.