

H10778

NOAA FORM 78-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic
Field No. RA-10-28-97
Registry No. H-10778

LOCALITY

State Alaska
General Locality Northwest Prince William Sound
Sublocality Southern Approaches to
Perry Passage

19 97

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE NOV. 5, 1998

HYDROGRAPHIC TITLE SHEET

H-10778

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-10-28-97

State Alaska

General locality Northwest Prince William Sound

Locality Southern Approaches to Perry Passage

Scale 1:10,000 Date of survey Sept. 17 to Oct. 28, 1997

Instructions dated 8/27/97, Change #1 10/1/97 Project No. OPR-P125-RA

Vessel RA-(2121), RA-3(2123), RA-5(2125)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by NOAA Ship RAINIER Personnel

Soundings taken by echo sounder, ~~hand level, etc.~~ DSF-6000N, Knudsen 320M

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: L. Deodato

~~Processed by~~ Automated plot by HP Design Jet 650C

Verification by M. Bigelow, D. Doles, E. Domingo, R. Mayor, L. Deodato

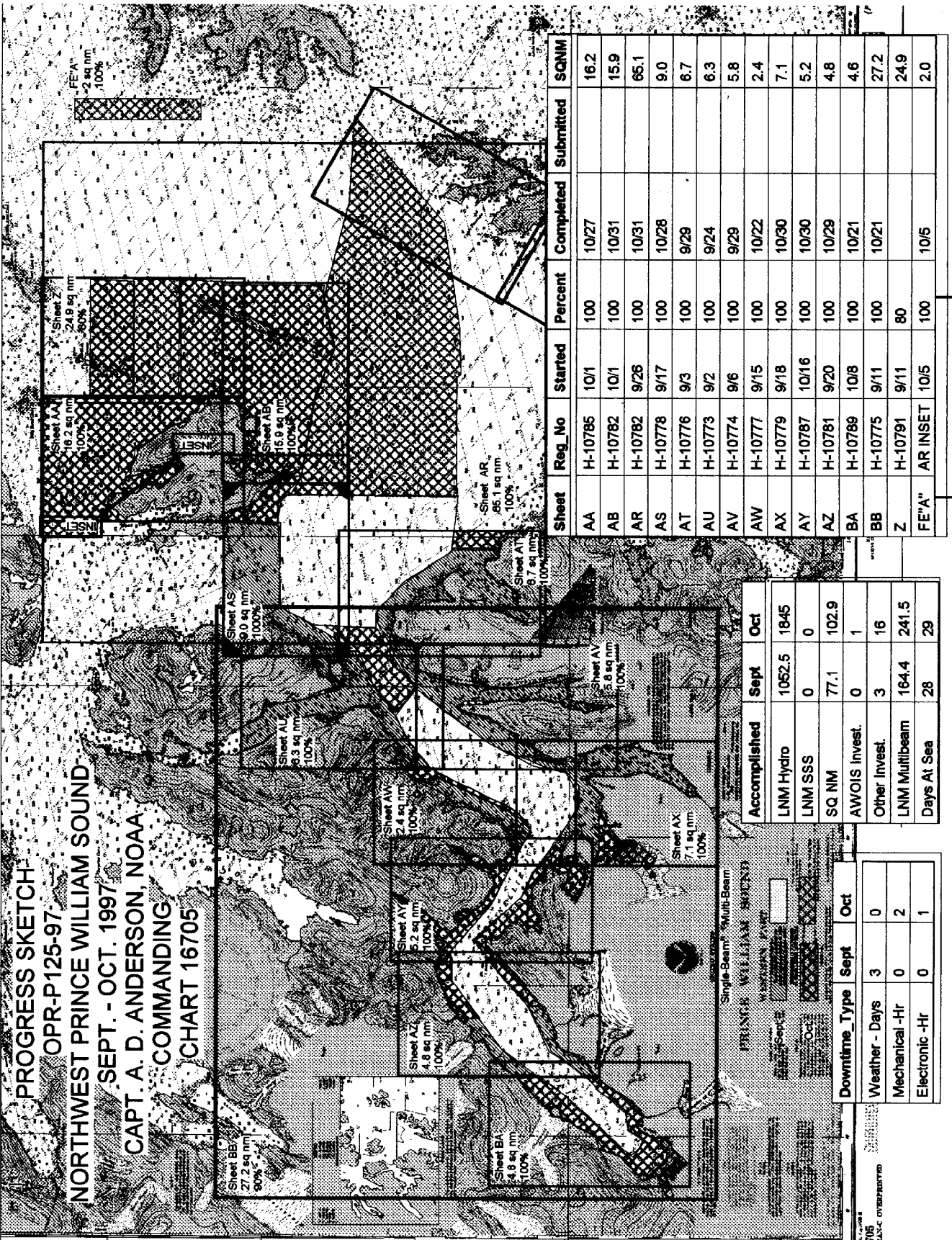
Soundings in fathoms ~~feet~~ at MLW MLLW and tenths

REMARKS: All times 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.

AWOIS ✓ & SURF ✓ by MBH 11/2/98

PROGRESS SKETCH
 OPR-P125-97
 NORTHWEST PRINCE WILLIAM SOUND
 SEPT. - OCT. 1997
 CAPT. A. D. ANDERSON, NOAA
 COMMANDING
 CHART 16705

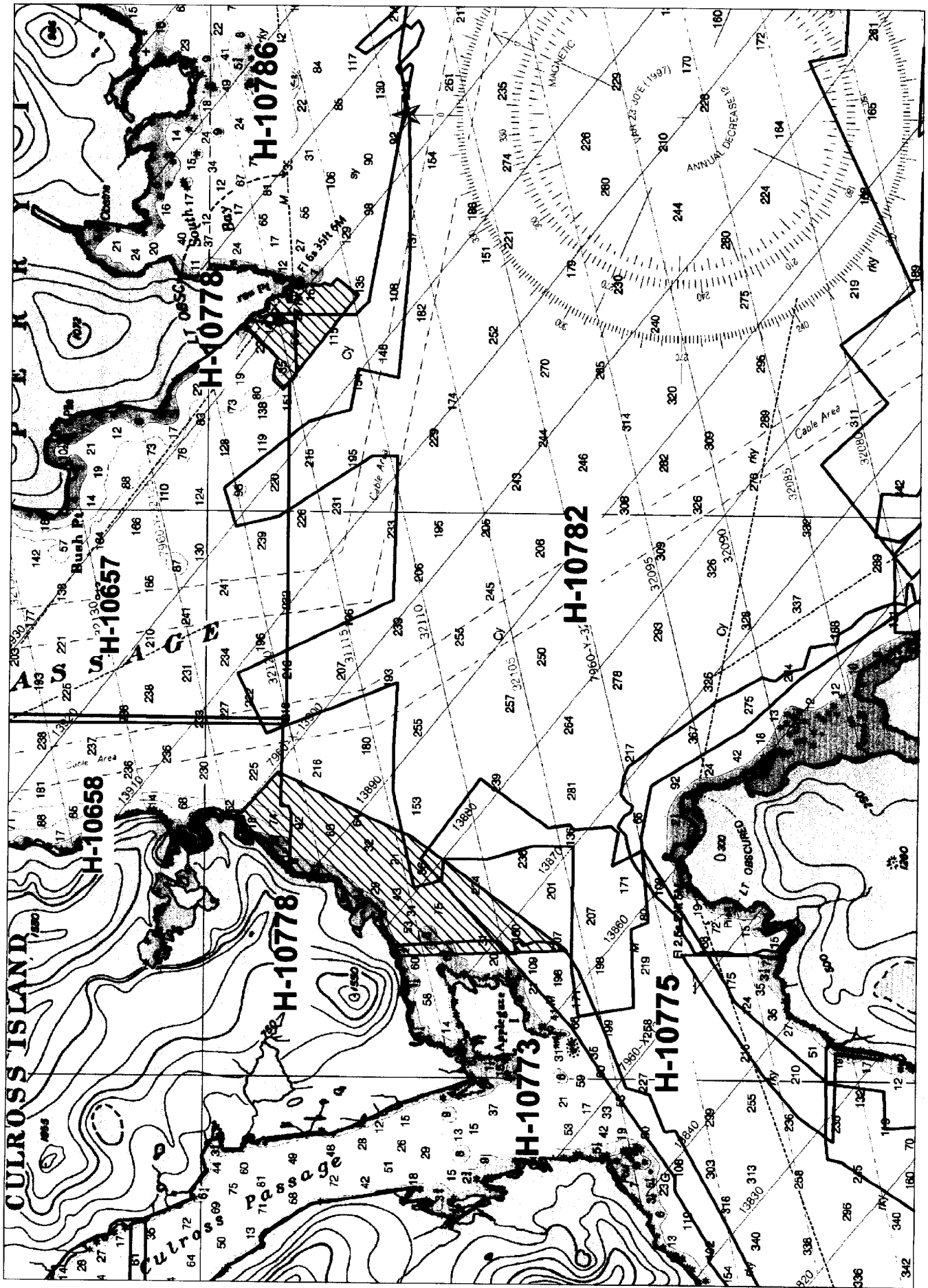


Sheet	Reg. No	Started	Percent	Completed	Submitted	SONM
AA	H-10785	10/1	100	10/27		16.2
AB	H-10782	10/1	100	10/31		15.9
AR	H-10782	9/28	100	10/31		65.1
AS	H-10778	9/17	100	10/28		9.0
AT	H-10776	9/3	100	9/29		6.7
AU	H-10773	9/2	100	9/24		6.3
AV	H-10774	9/6	100	9/29		5.8
AW	H-10777	9/15	100	10/22		2.4
AX	H-10779	9/18	100	10/30		7.1
AY	H-10787	10/16	100	10/30		5.2
AZ	H-10781	9/20	100	10/29		4.8
BA	H-10789	10/8	100	10/21		4.6
BB	H-10775	9/11	100	10/21		27.2
Z	H-10791	9/11	80			24.9
FE"A"	AR INSET	10/5	100	10/5		2.0

Accomplished	Sept	Oct
LNM Hydro	1052.5	1845
LNM SSS	0	0
SQ NM	77.1	102.9
AWOIS Invest.	0	1
Other Invest.	3	16
LNM Multibeam	164.4	241.5
Days At Sea	28	29

Downtime Type	Sept	Oct
Weather - Days	3	0
Mechanical - Hr	0	2
Electronic - Hr	0	1

16705
 NOAA/CENTERS FOR ENVIRONMENTAL AND ESTUARINE SCIENCE



Descriptive Report to Accompany Hydrographic Survey H-10778

Field Number RA-10-28-97

Scale 1:10,000

September 1997

NOAA Ship RAINIER

Chief of Party: Captain Alan D. Anderson, NOAA

A. PROJECT ✓

This basic hydrographic survey was completed in Northwest Prince William Sound as specified by Project Instructions OPR-P125-RA dated August 27, 1997. Survey H-10778 corresponds to sheet AS as defined in the sheet layout. This survey will provide data to supersede surveys performed in 1913, 1948-49, and 1961.

Requests for hydrographic surveys and updated charts in this area have been received from the Defense Mapping Agency, the U.S. Coast Guard, the Southwest Alaska Pilot's Association, cruise ship lines, and local fishermen.

B. AREA SURVEYED ✓ *See Eval Report, Section B*

The survey area is in Prince William Sound at the southern approaches to Perry Passage. The survey's northern limit is $60^{\circ} 39' 22''$ N, the southern limit is $60^{\circ} 36' 52''$ N, the western limit is $148^{\circ} 07' 45''$ W and the eastern limit is $147^{\circ} 56' 00''$ W. The survey was confined to within 0.5 nautical miles of Culross & Applegate Islands to the west and Perry Island to the east. Data acquisition was conducted from September 17th to October 28th, 1997 (DN 260-301). The survey area is divided into two distinct areas and described as follows: East side of Culross Island from latitude $60^{\circ} 40' 45''$ N to latitude $60^{\circ} 36' 52''$ N offshore to 200 fathoms, South end of Perry Island from latitude $60^{\circ} 37' 45''$ N to latitude $60^{\circ} 34' 42''$ N offshore to 100 fathoms.

Data were acquired by RAINIER and her survey launches as noted in the Survey Information Summary printout appended to this report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING ✓

All data were acquired using HYPACK version 997 and preliminary processing was accomplished with HPS and MapInfo. Final Detached Positions, Features, and Soundings based on predicted tides were saved in MapInfo 4.1 format. The MapInfo workspaces are described in Appendix VIII. *

E. SONAR EQUIPMENT ✓

Neither Side Scan Sonar nor multi-beam echo sounder 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. *No new problems, which affect survey data, were encountered. DSF-6000N soundings generally were acquired in meters using the High + Low, high frequency digitized setting, but in depths over 300 meters, low frequency was scanned in place of the high when the fathometer lost its high frequency trace.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

Four sound velocity casts were acquired within the project limits as shown in the appended Survey

** Filed with the hydrographic data.*

Information Summary report. 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 3.3 (1997), in accordance with Field Procedures Manual (FPM) section 2.4.3. Printouts of the sound velocity profile, data, and correctors used in field processing are included in the "Separates to be Included with Survey Data, IV. Sounding Equipment Calibrations and Corrections".*

A static transducer depth was determined using FPM Fig 2.2 for vessels 2121, 2122, 2123, and 2125 in the spring of 1997. The static draft and offsets for RAINIER, 2120, were collected in 1995. 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-P125-RA-97. The data for vessels 2121, 2122, and 2123 were collected in Shilshole Bay, Washington in March 1997. The data for 2124 and 2126 were collected in 1996. The data for vessel 2125 were collected in Young Bay, 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. The offset tables are included with project data for OPR-P125-RA-97*. 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 Cordova, Alaska reference station (945-4050). ~~HAPS~~ ^{HAPS} listings of the data used in generating tidal correctors are included in Appendix V of this report. Tidal correctors as provided in the project instructions for H-10778 are shown on the appended Survey Information Summary report

Valdez, Alaska (945-4240) and Cordova, Alaska (945-4050) are the primary control stations for datum determination at all subordinate stations. RAINIER personnel installed Sutron 8200 tide gages at Applegate Island (945-4794) on September 1, 1997 and Herring Point (945-4691) on September 2, 1996; the gages were removed on October 30 and October 31, 1997, respectively.

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/OES212 in accordance with HSG 50 and FPM 4.3. A request for approved tides was forwarded to N/OES23 in accordance with FPM 4.2.3.

Approved tide note dated February 5, 1998 is attached.

H. CONTROL STATIONS ✓ *See Eval Rpt., Section 4*

The horizontal datum for this project is NAD 83. Station ROCK, recovered in 1996 and checked in 1997, was used to verify and establish local geodetic control for this survey. See the OPR-P125-RA-97 Horizontal Control Report for more information. *Copy attached to this report.*

I. HYDROGRAPHIC POSITION CONTROL ✓

All soundings were positioned using differential GPS. Primary hydrographic control was based on the VHF differential reference station at ROCK. USCG beacons located at the Kenai Peninsula, Cape Hinchinbrook, Kodiak Island and Potato Point were also received in this area. Station ROCK was repeated on a second VHF frequency by the ship and was used when possible.

Launch-to-launch DGPS performance checks were performed in accordance with Section 3.4.4 of the FPM. Two observations of position were made from two different DGPS base stations while the launches were rafted together with their GPS antennae within 2-3 meters of each other. RAINIER also used SHIPDIM, version 2.2R (April 1996) with a Trimble Centurion P-code receiver and an Ashtech sensor (both differentially-corrected) to monitor the performance of the USCG Beacon. Periodic comparisons and occasional performance checks were logged with the SHIPDIM system. Some outliers were noted, but none indicated systematic or continuous errors in the beacons. The SHIPDIM OUTLIER.SUM results are included in the project data for OPR-P125-RA-97.

** Filed with the hydrographic data.*

J. SHORELINE ✓ See Eval Rpt., Section J

The shoreline manuscript from Coastal Mapping survey CM-92011 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files from DM-10189 and DM-10188 were projected to the survey grid with OPR-P125-RA-97 geodetic parameters using program Shore version 2.0, provided by N/CS32, and plotted on the survey using ~~HDAPS~~ ^{HPS}.

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 5-50 meters offshore of apparent low tide, generally 3-20 meters of depth at Mean Lower Low Water. Features shown on the SHORELINE NOTES layer in the MapInfo workspace 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* was inadvertently conducted north of the survey limit along Culross Island. This area was surveyed in 1995 (H10658, 1995), therefore no additional hydrographic information was collected in 1997, offshore of the NALL. One line of hydro was run approximately 100 meters offshore from latitude 65/59'N to latitude 65/40'N and has been plotted on the smooth sheet. Shoreline verification data from H-10658 has been shown in red within the common area of the present survey. Shoreline manuscript and field features were compared to an enlargement of chart 16705 BSB version. This raster image was registered in MapInfo and plotted at survey scale by RAINIER personnel for ~~HDAPS~~ ^{HPS} sounding comparison. There was general agreement between the charted and manuscript shoreline and what the hydrographer found on this survey.

Charted shoreline features that were not found on the manuscript were verified by field positions when offshore of the NALL. Discrepancies between charted and field shoreline should thus be resolved in favor of the manuscript shoreline and field work as shown on the final field Detached Position and Bottom Sample plot. There are no serious discrepancies between the manuscript and field shorelines. However, in general, manuscript rocks were in reality high points of ledges. ^{Concur} Shoreline verification data was analyzed during office processing and shown on the smooth sheet as warranted.

K. CROSSLINES ✓

Crosslines agreed within 2 meters with mainscheme hydrography, except in areas of steep bathymetry. There were a total of 10.9 nautical miles of crosslines, comprising 29% of mainscheme hydrography.

L. JUNCTIONS ✓ See Eval Report, Section L

This survey junctions with the following surveys: H-10658, 1:10,000, 1995 to the northwest, H-10657, 1:10,000, 1995 to the northeast, H-10773, 1:10,000, 1997 to the west, H-10782, 1:40,000, 1997 to the south, H-10786, 1:10,000, 1997 to the east. Soundings on these surveys were found to be in good agreement, matching within 2 meters. 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

Prior surveys H-3570, 1:20,000, 1913, H-7678, 1:20,000, 1948-49, and H-8607, 1:10,000, 1961 cover this survey. The prior soundings agreed well with the present survey, except on steep slopes and where shoaler depths were found during this survey ^{Concur} with due to denser sounding coverage. Survey H-7678 had some discrepancies near 60° 38' North, 148° 06' 15" West. H-7678 depicts shoaler depths than the current survey, as much as 50 fathoms shoaler. This area is steep, with a slope greater than 68 percent; the depths fall 100 meters depth in as little as 140 meters distance and is over 1.4 kilometers from Culross Island. The prior survey may have mispositioned the soundings in this area. ^{Concur} It is likely that data acquisition techniques and prior sounding methodology in combination with surveying on a steeply sloping bottom profile have contributed to these depth differences. Representative samples of selected soundings from the prior surveys are compared with the current survey below. Contours compared favorably between H-8607 and H-10778, but current contours are much more

complex than depicted on survey H-3507⁷⁰, especially the 6-fathom shoal east of Applegate Island and the 36 fathom rise southeast of Perry Island. Shoreline features were not depicted on survey H-3507⁷⁰, therefore several features were annotated during the current survey; only the most significant features are listed below. Shoreline features compared favorably between H-8607 and H-7678 and the current survey. *Concur*

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

⁷⁰ H-3507	H-10778	Geographic Position	H-10778 Fix Number
196 fm	195.7 fm ✓	60° 37' 35.184" N 148° 06' 59.695" W	2441
55 fm	47.4 fm ✓	60° 37' 31.296" N 148° 07' 30.036" W	50243
38 fm	32.0 31.9 fm ✓	60° 38' 11.080" N 148° 07' 03.972" W	2603 +1
No feature	Rock ✗ (3)	60° 39' 35.316" N 147° 56' 31.920" W	2223 <i>deleted</i>
27 fm	5 21.6 fm ✓	60° 39' 12.312" N 147° 56' 28.788" W	1142 +1
No feature	Rock 1 Rk ✓	60° 38' 43.836" N 148° 06' 56.988" W	40
No feature	Rock 0 Rk ✓	60° 38' 43.584" N 148° 06' 55.584" W	41
47 fm	1 36.2 fm ✓	60° 39' 21.539" N 147° 57' 22.666" W	1305
46 fm	38.9 fm ✓	60° 39' 16.470" N 147° 57' 16.625" W	1545
None 17 fm	3 6.7 fm ✓	60° 38' 04.380" N 148° 07' 30.288" W	2830 +1

H-8607	H-10778	Geographic Position	H-10778 Fix Number
32 fm	31.3 fm ✓	60° 37' 36.264" N 148° 07' 36.944" W	505
50	50.8 ✓	60° 37' 44.814" N 148° 07' 37.222" W	545
15 fm	14.7 fm ✓	60° 37' 55.686" N 148° 07' 39.781" W	2874
45 fm	50.2 fm ✓	60° 37' 56.503" N 148° 07' 19.308" W	2524
101 fm	112.7 fm ✓	60° 37' 37.340" N 148° 07' 14.815" W	2425
128 fm	142.7 fm ✓	60° 37' 55.884" N 148° 06' 43.124" W	781
74 fm	78 fm ✓	60° 37' 58.703" N 148° 06' 55.588" W	50224
216 fm	215.1 fm ✓	60° 37' 40.663" N 148° 06' 37.271" W	667
6 fm	6.3 fm ✓	60° 38' 04.363" N 148° 07' 30.098" W	2830 +1

H-7678	H-10778	Geographic Position	H-10778 Fix Number
134 fm	127.4 fm ✓	60° 39' 07.524" N 148° 05' 12.336" W	50091
201 fm	219.3 fm ✓	60° 39' 20.412" N 148° 04' 55.200" W	50118
49 fm	48.5 fm ✓	60° 38' 13.229" N 148° 06' 37.400" W	50214
26 fm	25.4 fm ✓	60° 38' 24.619" N 148° 05' 55.061" W	2108
156 fm	204.2 fm ✓	60° 37' 58.260" N 148° 06' 08.262" W	903
64 fm	63.8 fm ✓	60° 39' 05.494" N 147° 56' 40.934" W	1138
125 fm	121.2 fm ✓	60° 38' 52.469" N 147° 55' 57.943" W	1586
48 fm	49 fm ✓	60° 39' 13.255" N 147° 57' 16.477" W	1357

N. ITEM INVESTIGATIONS ✓

None. *Concur*

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

Charts 16705, 1:80,000, 16th edition, August 24, 1996 and 16700, 1:200,000, 25th edition, September 21, 1996, are the largest scale charts covering the survey area. Soundings from this survey are in agreement or shoaler than charted soundings. 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.

* *See Eval Rpt, section M regarding comparison of charted prior survey soundings.*

Dangers to Navigation ✓

No dangers to navigation were discovered during this survey. *concur*

P. ADEQUACY OF SURVEY ✓

Survey H-10778 is complete and adequate to supersede prior soundings and features in their common areas.

Q. AIDS TO NAVIGATION ✓

No navigational aids exist within the survey area. *Do not concur*
Perry Island Light plots on the southern tip of Perry Island and has been transferred from junctional survey H-10766.
Refer to H-10766 for positional information.

R. STATISTICS ✓

Refer to the Survey Information Summary attached to 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 performed and indicate that water visibility was three to eight meters, depending on the amount of glacial sediment and rain runoff carried in the water column.

T. RECOMMENDATIONS ✓

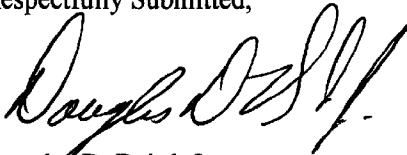
The hydrographer recommends that minimum bottom sample spacing on surveys be increased to twenty centimeters at the scale of the survey unless the hydrographer needs denser spacing to show variability of characteristics or to delimit anchorage areas. ~~Corax~~

U. REFERRAL TO REPORTS ✓

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

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
OPR-P125-RA Horizontal Control Report	November, 1997	N/CS34
OPR-P125-RA 1997 Coast Pilot Report	November, 1997	N/CS26
Project related data for OPR-P125-RA	Incremental	N/CS34
Secchi Disk Observations for OPR-P125-RA	November, 1997	N/CS31

Respectfully Submitted,



Douglas D. Baird, Jr.
Lieutenant, NOAA

Approved and Forwarded,



Alan D. Anderson
Captain, NOAA
Commanding Officer

Survey Information Summary

Project: OPR-P125-97 **Project Name:** NORTHWEST PRINCE WILLIAM SOUND

Instructions Dated: 8/27/97 **Project Change Info:**

Change #	Dated
1	9/24/97

Sheet Letter: AS **Registry Number:** H-10778

Sheet Number: RA-10-28-97

Survey Title: SOUTHERN APPROACHES TO PERRY PASSAGE

Data Acquisition Dates: **From:** 17-Sep-97 260 **To:** 28-Oct-97 301

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2121	4	4	2	2	6	7		
2123	1	1		2				
2125							1	

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
2		260	632	60/35/30	260,262
				148/10/20	
3		273	564	60/40/27	272
				148/04/02	
4		277	979	60/35/09	291,292
				147/44/27	
6		300	597.7	60/43/45	301
				147/50/30	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS42		X0.95

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4691	HERRING POINT	9/2/97	10/31/97
945-4794	APPLEGATE ISLAND	9/1/97	10/30/97

Statistics Summary

Type	Total:
BS	7
DEV	11.77
DP	19
MS	36.79
S/L	2.41
SPLIT	26.25
XL	10.89

Percent XL: 29.6%

SQNM: 9

CONTROL STATIONS as of 1 Dec 1997 ✓

No	Type	Latitude	Longitude	H	Cart	Freq	Vel Code	MM/DD/YY	Station Name
1		060:14:18.000	146:38:48.000	0	0	0.0	0.0	04/06/96	CAPE HINCHINBROOK USCG BECON
2		060:27:20.117	148:39:54.333	0	0	0.0	0.0	10/01/97	DON DGPS
3		060:03:23.000	146:41:48.000	0	0	0.0	0.0	03/01/96	POTATO POINT USCG BEACON
4		060:39:13.513	147:58:26.500	18	0	0.0	0.0	00/00/00	ROCK

GEOGRAPHIC NAMES

H-10778

Name on Survey	A ON CHART NO. 16700 16705 B ON PREVIOUS SURVEY NO. C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K									
	ALASKA (title)	X								
CULROSS ISLAND	X		X							2
MEARES POINT	X		X							3
PERRY ISLAND	X		X							4
PERRY PASSAGE	X		X							5
PRINCE WILLIAM SOUND (title)	X		X							6
SOUTH BAY	X		X							7
										8
										9
										10
										11
										12
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										24
										25

Approved

Danny Rosenberg
Chief Geographer

APR 2 1998



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 5, 1998

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-P125-RA-97
HYDROGRAPHIC SHEET: H-10778

LOCALITY: Northwest Prince William Sound, AK

TIME PERIOD: Sep 17 - Oct 29, 1997

TIDE STATION USED: 945-4691 Herring Point, Knight Island Passage
Lat. 60° 28.5'N Lon. 147° 47.5'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.326 meters

TIDE STATION USED: 945-4729 Pt. Perry, Perry Island
Lat. 60° 45.1'N Lon. 147° 57.8'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.386 meters

TIDE STATION USED: 945-4794 Applegate Island
Lat. 60° 37.4'N Lon. 148° 09.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.385 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: PWS42 & PWS52
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.



CHIEF, OPERATIONAL ANALYSIS BRANCH

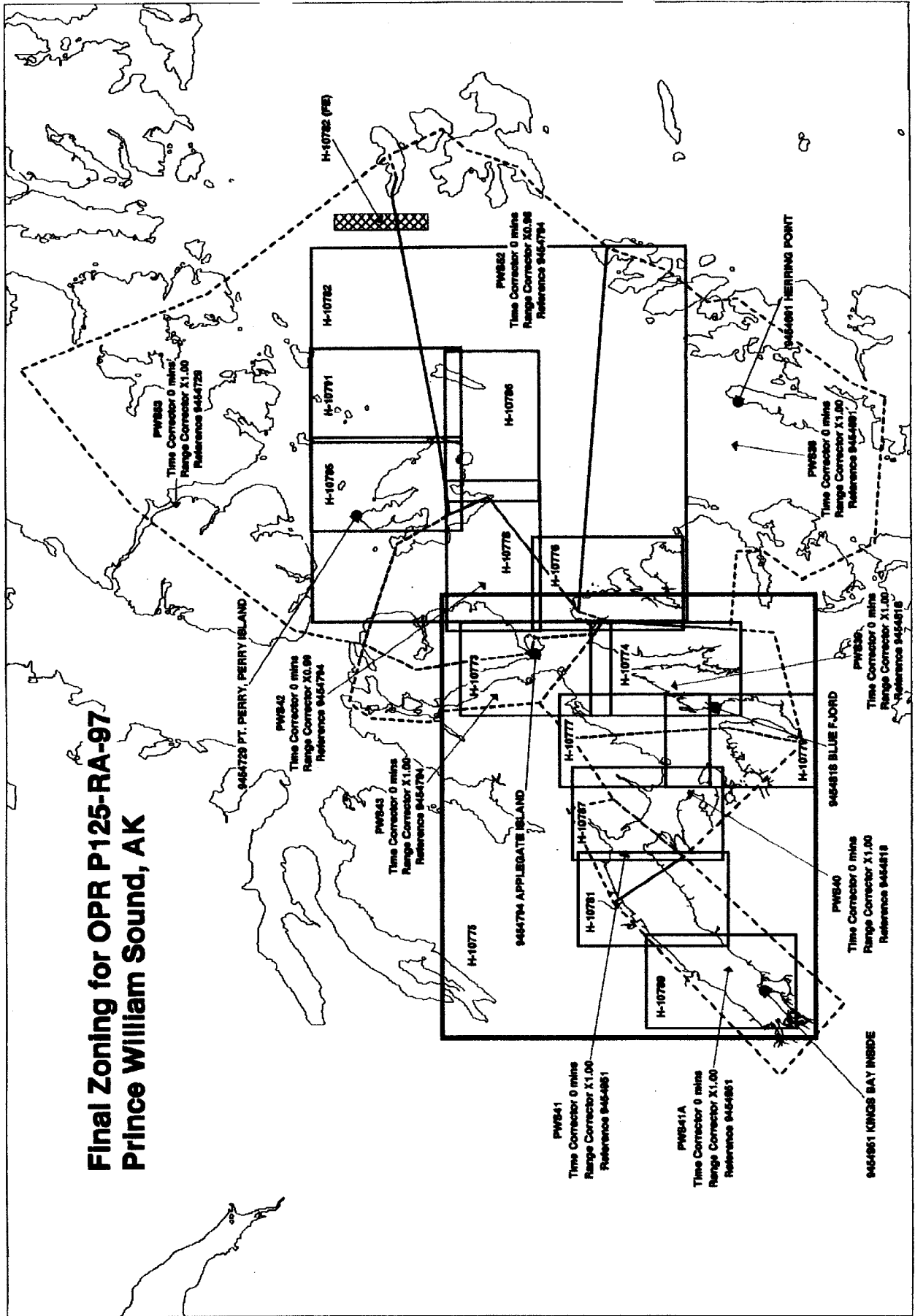


Final tide zone node point locations for OPR P125-RA-97,
H-10778.

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 PWS42				
-148.101183	60.592465	945-4794	0	0.99
-147.93198	60.657934	945-4729	0	1.00
-147.957558	60.686216	945-4691	0	1.01
-148.000248	60.724243			
-148.149283	60.748856			
-148.18628	60.710814			
-148.164093	60.631914			
-148.158371	60.62628			
-148.140411	60.624813			
-148.135079	60.580714			
-148.114598	60.574838			
-148.101183	60.592465			
Zone PWS52				
-147.93198	60.657934	945-4794	0	0.98
-147.957558	60.686216	945-4729	0	0.99
-147.848006	60.693887	945-4691	0	1.00
-147.48158	60.72734			
-147.456957	60.723688			
-147.422995	60.72893			
-147.385582	60.690765			
-147.416199	60.672546			
-147.441099	60.63539			
-147.474131	60.622033			
-147.560712	60.570642			
-148.101183	60.592465			
-147.93198	60.657934			

Final Zoning for OPR P125-RA-97 Prince William Sound, AK



APPROVAL SHEET

for

H-10778

Standard field surveying and processing procedures were followed in producing this examination in accordance with the Hydrographic Manual, Fourth Edition; the Hydrographic Survey Guidelines; and the Field Procedures Manual, as updated for 1994.

The digital data and supporting records have been reviewed 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.

DATE: November 25, 1997

Approved and Forwarded,



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

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

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

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

SHORELINE DATA	
SHORELINE MAPS (List):	DM 10188 and DM 10189
PHOTOBATHYMETRIC MAPS (List):	NA
NOTES TO THE HYDROGRAPHER (List):	NA
SPECIAL REPORTS (List):	NA
NAUTICAL CHARTS (List):	16705 17th Ed., 9/27/97

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	6		6
VERIFICATION OF CONTROL			
VERIFICATION OF POSITIONS			
VERIFICATION OF SOUNDINGS			
VERIFICATION OF JUNCTIONS			
APPLICATION OF PHOTOBATHYMETRY			
SHORELINE APPLICATION/VERIFICATION			
COMPILATION OF SMOOTH SHEET	72		72
COMPARISON WITH PRIOR SURVEYS AND CHARTS		36	36
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS			
EVALUATION REPORT		24	24
GEOGRAPHIC NAMES			
OTHER*			
*USE OTHER SIDE OF FORM FOR REMARKS	TOTALS	78	60
			138

Pre-processing Examination by Pacific Hydrographic Branch	Beginning Date 12/19/97	Ending Date 12/19/97
Verification of Field Data by M. Bigelow, D. Doles, E. Domingo, L. Deodato	Time (Hours) 78	Ending Date 8/21/98
Verification Check by B. Olmstead	Time (Hours) 5	Ending Date 9/11/98
Evaluation and Analysis by L. Deodato	Time (Hours) 60	Ending Date 9/8/98
Inspection by B. Olmstead	Time (Hours) 6	Ending Date 9/17/98

EVALUATION REPORT

H-10778

A. PROJECT

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

B. AREA SURVEYED

The survey area is adequately discussed in the hydrographer's report. Depths generally range from -0.5 to 225 fathoms. The bottom consists primarily of sand, mud, and pebble.

The hydrographer has determined the survey limits in accordance with the approved sheet layout and project limits created in MapInfo. A page-size chartlet of the survey area indicating the limits of supersession is included in this report as Attachment A.

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 Processing System (HPS) software used by the hydrographer, AutoCad (Version 13.0), and MicroStation 95.

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 MicroStation drawing format, i.e., dgn (extension); and in the more universally recognized graphics transfer format, .dxf (extension). Copies of these files will be retained at PHB until data forwarded to headquarters has been accepted and approved. 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 which 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 1:10,000 scale sheet.

E. SONAR EQUIPMENT

Side Scan Sonar and Multibeam Echo Sounder were not used on survey H-10778.

F. SOUNDING EQUIPMENT

Sounding equipment has been adequately addressed in the hydrographer's report.

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 gage: Applegate Island, Alaska, gage 945-4794. Herring Point, Knight Island Passage, Alaska, gage 945-4691 and Point Perry, Perry Island, Alaska, gage 945-4729 listed in the Tide Note were not used.

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 field values based on NAD 83. The geographic positions of all survey data are based on NAD 83. The smooth sheet is annotated with an NAD 27 adjustment tick based on values determined with the NGS program NADCON. Geographic positions based on NAD27 may be plotted on the smooth sheet utilizing the NAD 83 projection by applying the following corrections.

Latitude: -2.079 seconds (-64.354 meters)
Longitude: 7.418 seconds (112.765 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 one position exceeds limits in terms of HDOP. This position is not used to position dangers to navigation. The sounding located by this fix is 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 10188 and DM 10189, scale 1:20,000 were compiled on NAD83 and apply to this survey. Shoreline drawn in black on the smooth sheet originates from the above digital manuscripts as provided in digital format 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-10778 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10657	1995	1:10,000	Northeast Limits
H-10658	1995	1:10,000	Northwest Limits
H-10773	1997	1:10,000	Southwest Limits
H-10775	1997	1:40,000	Southwest Limits
H-10782	1997	1:40,000	Middle Limits
H-10786	1997	1:10,000	Northeast Limits

The junctions with surveys H-10773, H-10775, H-10782, and H-10786 are complete. Several depths within the common areas have been transferred to the present survey to better portray the bottom configuration and standard depth curves. A "Joins" note has been added to the smooth sheet.

The junctions with surveys H-10657 and H-10658 were not formally completed since these surveys were previously processed and forwarded for charting. Soundings and depth curves are in adequate agreement. The standard depth curves portrayed on the present survey within the common areas of the 1995 surveys which considered both data sets should supersede within the common areas of the 1995 survey work. A few depths from the junctional surveys have been transferred to the present survey to better portray the bottom configuration. "Adjoins" notes have been added to the smooth sheet.

M. COMPARISON WITH PRIOR SURVEYS

The present survey was compared to the following prior survey work.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-3570	1913	1:40,000

The prior survey depths were collected using leadlines. In comparison with the present survey, soundings were found to generally differ from 0-7 fathoms with the current survey revealing consistently deeper depths. However, shoal depths on the prior survey were either verified and or found to be a larger extent of shoal areas.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>
H-7678	1949	1:20,000
H-8607	1961	1:10,000

In comparison with H-10778, soundings were found to generally differ by 1-4 fathoms in depths to fifty fathoms. Average differences of 7-16 fathoms are readily seen when comparing to the prior surveys in depths ranging from 50 to 100 fathoms. The area of greatest depth difference occurs in depths over 100 fathoms where soundings differ from 20-50 fathoms from survey work conducted in 1949-1961. The present survey reveals a consistently deeper trend throughout the common areas. However, shoal areas on the prior surveys were substantiated during current survey work and found to be shoaler and or greater in extent.

Depth differences with the prior surveys may be attributed to greater sounding coverage, improved positioning, sounding methods and relative accuracy of the data acquisition

techniques. These differences are further exaggerated by the conduct of survey operations over a steeply sloping bottom.

Two ledge features from H-8607 have been brought forward in violet to the smooth sheet at latitude 60/38/47N, longitude 148/06/40W and latitude 60/39/03N, longitude 148/06/30W. These features generally fall outside the NALL and were not specifically addressed by the hydrographer.

With the exception of the prior survey ledges transferred to the present survey, H-10778 is adequate to supersede the prior surveys within the common area.

N. ITEM INVESTIGATIONS

There were no AWOIS items assigned to this survey.

O. COMPARISON WITH CHART

Survey H-10778 was compared with the following chart.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16705	17th	Sept. 27, 1997	1:80,000	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.

In accordance with Hydrographic Survey Guideline No. 39, the effects of the 1964 Prince William Sound Earthquake were considered in the comparison of this survey, however, no reasonable adjustment value for prior soundings could be determined.

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

Survey H-10778 is adequate to supersede charted hydrography within the common area.

b. Dangers to navigation

No dangers to navigation were discovered during survey operations. No additional dangers to navigation were found during office processing.

P. ADEQUACY OF SURVEY

Hydrography contained on survey H-10778 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, with the exception of the following.

In the event that the field units submission of survey data will exceed four weeks from the completion of 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 will forward their explanation through the Marine Center Director. Fieldwork for survey H-10778 was completed on October 28, 1997 but not transmitted for office processing until December 8, 1997.

Q. AIDS TO NAVIGATION

Perry Island Light was transferred from H-10786 to the smooth sheet. There were no floating aids to navigation within the survey area.

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

R. STATISTICS

Statistics are itemized in the hydrographer's report.

S. MISCELLANEOUS

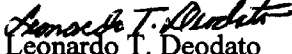
Miscellaneous information is discussed in the hydrographer's report. No additional miscellaneous items were noted during office processing.

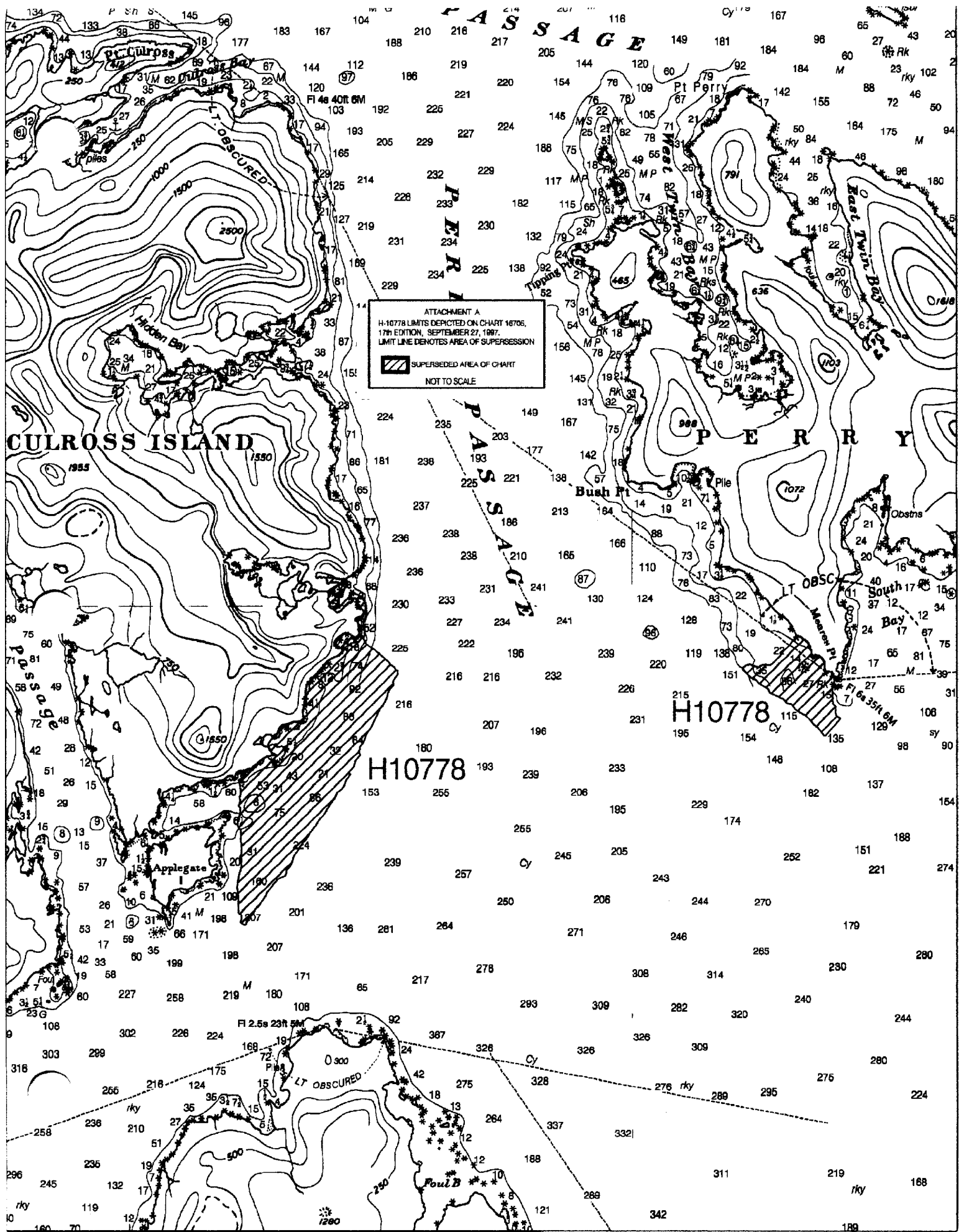
T. RECOMMENDATIONS

This is a good hydrographic survey. See section T of the hydrographer's report for additional information.


U. REFERRAL TO REPORTS

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


Leonardo T. Deodato
Cartographer



ATTACHMENT A
H-10778 LIMITS DEPICTED ON CHART 16706,
17th EDITION, SEPTEMBER 27, 1987.
LIMIT LINE DENOTES AREA OF SUPERSESSION

 SUPERSEDED AREA OF CHART
NOT TO SCALE

H10778

H10778

APPROVAL SHEET
H-10778

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: 9/18/98
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: 10/16/98
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Andrew A. Armstrong III Date: Nov. 5, 1998
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

