

H10781

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-10-30-97
Registry No. H-10781

LOCALITY

State Alaska
General Locality Northwest Prince William Sound
Sublocality Entrance to Kings Bay

1997

CHIEF OF PARTY
CAPT Alan D. Anderson, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H-10781

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-10-30-97

State Alaska

General locality Northwest Prince William Sound

Locality Entrance to Kings Bay

Scale 1:10,000 Date of survey Sept 20 - Oct 29, 1997

Instructions dated August 27, 1997 * Project No. OPR-P125-RA

Vessel RA-1(2121), RA-3(2123), RA-5(2125)

Chief of party CAPT Alan D. Anderson, NOAA

Surveyed by CAPT A. Anderson, LT G. Noll, LT D. Baird, SST S. Baum
SST N. Quanbeck, ST J. Cheech, ST S. McMann

Soundings taken by echo sounder, hand lead, pole DSF-6000N, Knudsen 320M

Graphic record scaled by RAINIER Personnel

Graphic record checked by RAINIER Personnel

Evaluation by: I. Almacen Automated plot by HP Design Jet 650C

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

Soundings in fathoms ~~xxxx~~ at ~~MLLW~~ MLLW and tenths

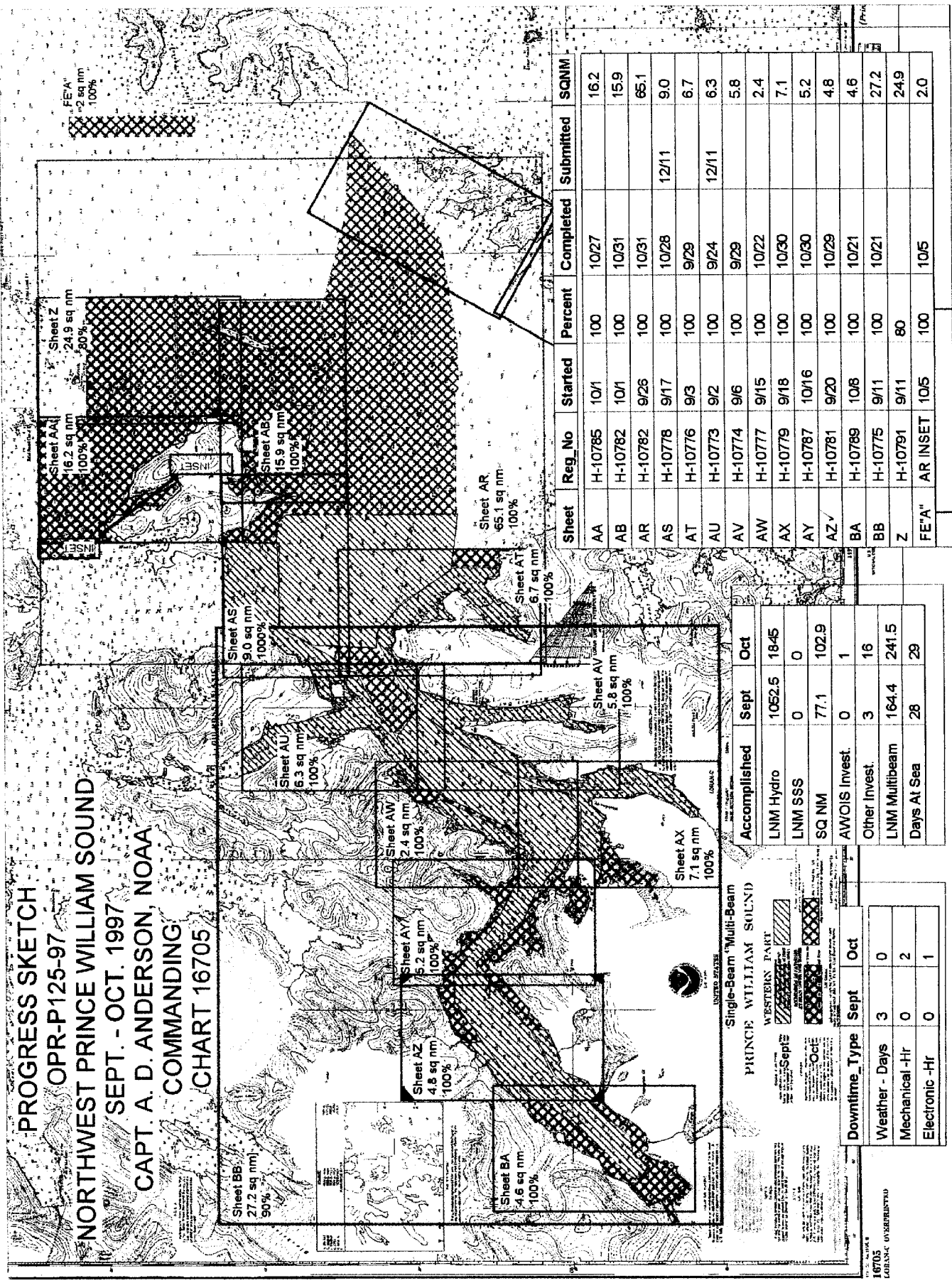
REMARKS: All times are UTC, revisions and marginal notes in black were
generated during office processing. All separates are filed
with the hydrographic data, as a result page numbering may be
interrupted or non-sequential.

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

Aweis / SURF

* Change 1 dated October 1, 1997 1/4/97 mcr

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



Sheet AA
16.2 sq nm
100%

Sheet Z
24.9 sq nm
80%

Sheet AB
15.9 sq nm
100%

Sheet ABC
15.9 sq nm
100%

Sheet AS
9.0 sq nm
100%

Sheet AU
6.3 sq nm
100%

Sheet AV
2.4 sq nm
100%

Sheet AX
7.1 sq nm
100%

Sheet AY
5.2 sq nm
100%

Sheet AZ
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Sheet BA
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Sheet BB
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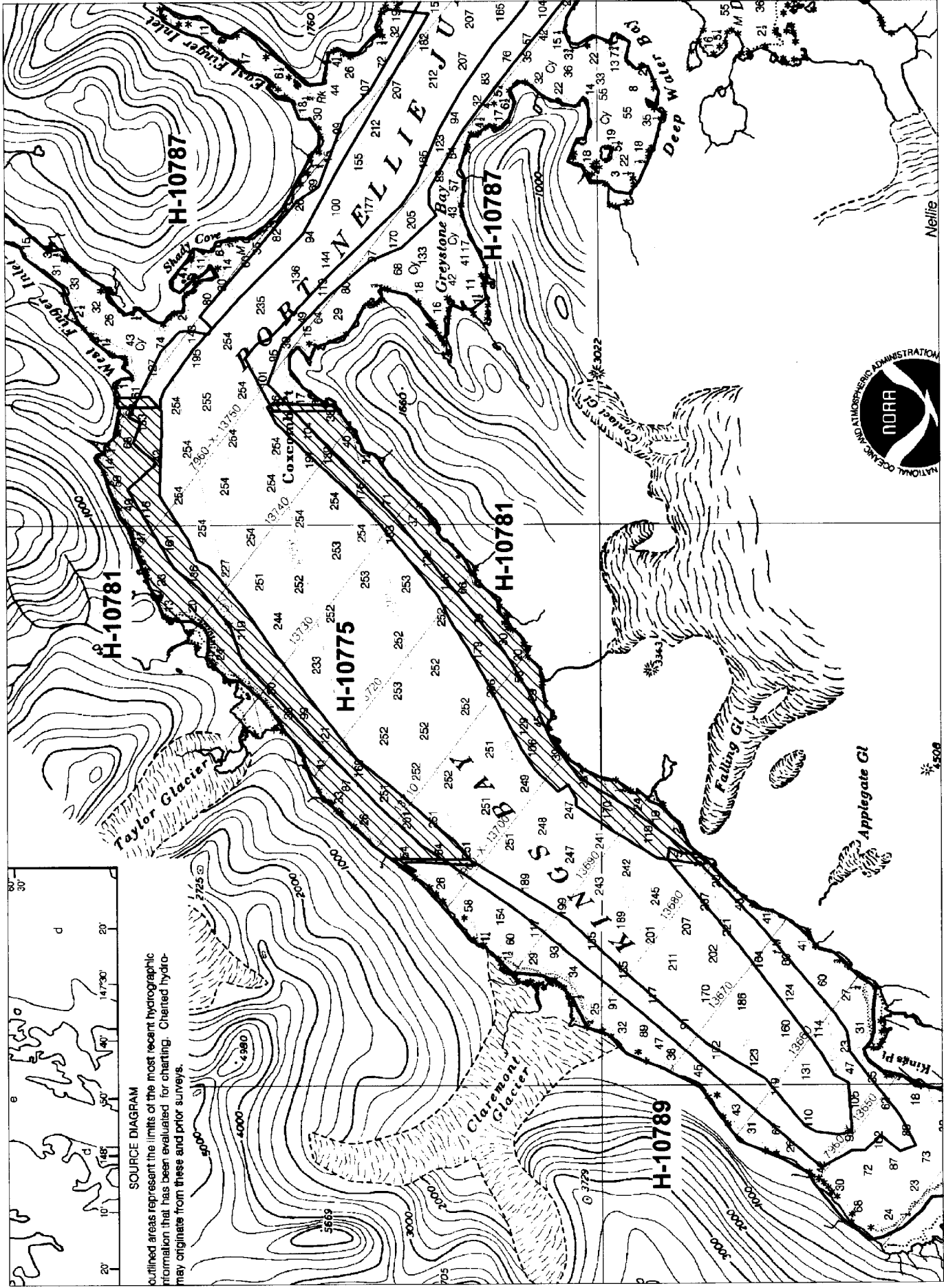
Sheet CF
4.6 sq nm
100%

Sheet	Reg_No	Started	Percent	Completed	Submitted	SQNM
AA	H-10785	10/1	100	10/27		16.2
AB	H-10782	10/1	100	10/31		15.9
AR	H-10782	9/26	100	10/31		65.1
AS	H-10778	9/17	100	10/28	12/11	9.0
AT	H-10776	9/3	100	9/29		6.7
AU	H-10773	9/2	100	9/24	12/11	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

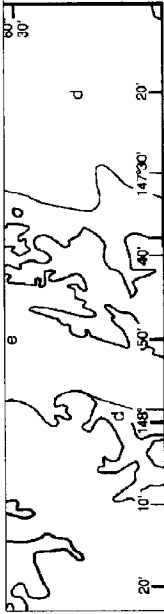
Downtime_Type	Sept	Oct
Weather - Days	3	0
Mechanical -Hr	0	2
Electronic -Hr	0	1

16705
 LOBLINC OVERPRINTED



SOURCE DIAGRAM

outlined areas represent the limits of the most recent hydrographic information that has been evaluated for charting. Charted hydrographic information may originate from these and prior surveys.



Descriptive Report to Accompany Hydrographic Survey H-10781

Field Number RA-10-30-97

Scale 1:10,000

October 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-10781 corresponds to sheet AZ as defined in the sheet layout. This survey will provide data to supersede surveys performed in 1959 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 RPT., Sec. B)

The survey area is in Prince William Sound at the entrance to Kings Bay. The survey's northern limit is the north shore of Kings Bay, the southern limit is latitude $60^{\circ} 29' 02.5''$ N, the western limit is longitude $148^{\circ} 36' 00''$ W, and the eastern limit is longitude $148^{\circ} 28' 00''$ W. The survey was confined to within 0.5 nautical miles of shore, the deep water is on survey H-10775. Data acquisition was conducted from September 20th to October 29th, 1997 (DN 263-302).

C. SURVEY VESSELS ✓

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. *

During the field acquisition of echo soundings, RAINIER personnel noticed that there was a one to two second delay between the digital data time and the raw master printout time of the soundings. Field processing of soundings further indicates that there may be an inconsistent delay between echosounder marking and final digital sounding time and position. The hydrographer's recommendation is in Section T. (See Section T of this report) (See Section L, for further discussion concerning data acquisition)

E. SONAR EQUIPMENT ✓

Neither Side Scan Sonar nor multi-beam echo sounder equipment was used on this survey. *Concur.*

F. SOUNDING EQUIPMENT ✓ (See Eval Rpt., section P)

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 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.

* Filed with the hydrographic data.

G. CORRECTIONS TO ECHO SOUNDINGS ✓

(#2, 4, 5 & 6)

Four sound velocity casts were acquired within the project limits as shown in the appended Survey 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". * Sound velocity casts were taken outside the surveyed area of H-10781.

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. *amcur.*

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). HDAPS 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-10781 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 1st, Blue Fiord (945-4818) on September 5th, and Kings Bay (945-4951) on September 10, 1997. The Applegate Island and Blue Fiord gages were removed on October 30th and the Kings Bay gage was removed on October 22, 1997. *amcur.*

On DN 302 (October 29th), after the Kings Bay tide gage had been removed, RAINIER personnel investigated a previously surveyed 1.1 fathom shoal. Launch 2121 collected about 45 minutes worth of soundings without re-installing the Kings Bay gage. This data was collected after conferring with headquarters on the best method to ensure a viable vertical datum was maintained, use of the tide gauge at Applegate Island (945-4794) was authorized. *The tide correctors applied to survey data collected on DN 302 (Development) were based on Blue Fiord gage (945-4818) instead of Applegate Is. gage (945-4794). The 1.1 fathom shoal originates from prior survey H-EVAL and was disproved during present survey work. ** 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., Sec. H)

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. Station DON, established in 1997, was used for positioning control inside Kings Bay. See the OPR-P125-RA-97 Horizontal Control Report for more information. *List of control stations used is included in this report.*

The data collected on DN 302 used station DON without using the MONITOR program to re-check the position of the station. *Data was analyzed during office processing and found to be consistent with surrounding survey data.*

I. HYDROGRAPHIC POSITION CONTROL (See EVAL. RPT., Sec. I)

All soundings were positioned using differential GPS. Primary hydrographic control was based on the VHF differential reference station at DON. USCG beacons located at the Kenai Peninsula, Cape Hinchinbrook, Kodiak Island and Potato Point were also received in this area. VHF differential reference station ROCK was

* Filed with the hydrographic data.

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.

J. SHORELINE (See EVAL. RPT., Sec. J)

The shoreline manuscript from Coastal Mapping survey CM-92012 was supplied by N/CS341 in Standard Digital Data Exchange Format (SDDEF). The digital files from DM-10192 and DM-10193 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.

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 5-15 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. *Field information was analyzed during office processing and applied to the smooth sheet as warranted.*

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 sounding comparison. There was general agreement between the charted and manuscript shoreline and what the hydrographer found on this survey. *Concur.*

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. *Concur.*

K. CROSSLINES ✓

Crosslines agreed within 5 meters with mainscheme hydrography, except in areas of steep bathymetry. There were a total of 10.9 nautical miles of crosslines, comprising 27% of mainscheme hydrography. *Concur.*
Crosslines were run in depths ranging from approximately 60 Fathoms to over 150 Fathoms.

L. JUNCTIONS (See EVAL. RPT., Sec. L)

This survey junctions with the following surveys: H-10789, 1:10,000, 1997 to the southwest, H-10787, 1:10,000, 1997 to the east, and H-10775, 1:40,000, 1997 in the center of Kings Bay. Soundings on these surveys were found to be in fair to poor agreement. Comparing H-10781 with survey H-10787 to the east, the soundings do not match well, with differences ranging between 2 to 40 meters. H-10775 has similar comparisons - differences range from 2 meters to 60 meters. H-10789 also has differences from H-10781 ranging from 0 meters to 64 meters.

There seems to be a trend in which DSF soundings have the largest difference from junction surveys, while Knudsen soundings match more closely, although some of the DSF soundings match very well. Also, some of the DSF soundings run offshore tend to be shallower and those run towards shore tend to be deeper - even for soundings acquired on the same day. A review of the data used for comparisons as well as the systems used to collect that data has revealed no definitive cause for differences of this magnitude. It is noted that the differences occur in areas with very steep slopes, deep depths, and potential localized water column anomalies. *Concur.*

Under these conditions, inherent differences in measurement systems such as beam width, frequency, power output, receiver sensitivity, bottom tracking functions, and timing latency are exaggerated. It is possible that apparently random differences between main scheme soundings on steep and deep slopes are attributable to weak returns from steep slopes in areas with water column anomalies. ^{Concur.} The automated bottom tracking functions on the sounders the ship is using can begin following relatively strong side lobe returns and lose track of the weaker main beam return. This will result in a significant shoal bias on lines run in the offshore direction. This is not significant to navigation as the difference is in the conservative direction and occurs in deep water. *Concur.*

The contours agree in general with the junctioning surveys. The single beam data differs with the multibeam survey H-10775, because of beam width, power output, and angle of incidence differences between the two systems. These differences can be significant on steep and deep slopes. ^{Concur. However see note below.} The deeper, multibeam soundings are more accurate, thus the hydrographer recommends using data from H-10775 in areas ^{deeper than 250 fathoms} where H-10780 overlaps with H-10775. Final comparisons will be made at the Pacific Hydrographic Branch (PHB) after reduction to final vertical datum. *Re-scanned echograms of single beam echo sounders to resolve most disagreements. Depths generally agree within 2-10 fathoms except in rough and extremely steep areas (See EVAL RPT., Sec 4)*

M. COMPARISON WITH PRIOR SURVEYS (See EVAL RPT., Sec. M)

Prior surveys H-8593, 1:10,000, 1961 and H-8491, 1:10,000, 1959 cover this survey. Agreement with the prior surveys is not consistent - some soundings match very well, while others are significantly different. The hydrographer noticed that soundings from the DSF fathometer compare more favorably to prior soundings than do soundings from the Knudsen fathometer, although there are exceptions. These differences could be attributable to the factors discussed in Section ~~M~~ and the fact the 1959 and 1961 surveys were conducted with old technology using possibly wider beam echo sounders and less accurate positioning system. ^{Concur.} The prior survey lines were also run parallel to the beach.

Representative samples of selected soundings from the prior surveys are compared with the current survey in Tables 1 and 2. Contours compared favorably between H-8491 & H-8593 and H-10778, but current contours are much more complex than depicted on prior surveys, due to denser sounding coverage. *Concur.*

Shoreline features compare favorably between H-8491 and H-8593 and the current survey. Only two features identified in prior survey H-8491 did not appear on the digital shoreline map - a rock and a ledge. The rock is at 60° 30' 10.7" N, 148° 34' 20.5" W and is identified by fix number 51335. The ledge is located at 60° 29' 04.8" N, 148° 36' 00.0" W. There are 5 rocks positioned during H-8491 and one rock positioned during H-8593 that were found to be ledges during H-10781. *Concur.*

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

N. ITEM INVESTIGATIONS ✓

None.

O. COMPARISON WITH THE CHART (See EVAL RPT., Sec. 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.

There were seven charted rocks disproved during H-10781. All seven of these rocks were mischarted from rocks positioned during survey H-8593. The rocks were drawn offshore from their correct position on beaches. *Concur.*
** Charted rocks were generalized offshore. The present survey found similar features just inshore of the charted rocks. Chart rocks as shown on the present survey.*

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

Dangers to Navigation ✓

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

H-8491	H-10781	Geographic Position	H-10781 Fix Number
105 fm	102. ⁹ 8 fm	60° 30' 36.792" N 148° 33' 43.560" W	1396 ✓
18 fm	18 fm ✓	60° 29' 34.656" N 148° 35' 04.928" W	1840 ✓
109 fm	116. ⁶ 8 fm	60° 29' 24.720" N 148° 35' 42.684" W	1770 ✓
26 fm	24. ³ 2 fm	60° 29' 23.944" N 148° 35' 17.592" W	1822 ✓
108 fm	98. ⁸ 7 fm	60° 29' 30.696" N 148° 35' 34.404" W	1762 ✓
94 fm	97. ⁶ 8 fm	60° 30' 21.780" N 148° 34' 18.696" W	1662 ✓
99 fm	89.6 134.9 fm ✓	60° 30' 48.636" N 148° 32' 31.452" W	2336 1329 ✓
107 fm	168. ⁸ 8 fm	60° 31' 25.860" N 148° 35' 51.720" W	2814 ✓
250 fm	89 249.1 fm	60° 31' 51.960" N 148° 34' 58.872" W	50570 ✓
56 fm	62. ¹ 3 fm	60° 32' 20.872" N 148° 34' 32.880" W	50446 ✓
110 fm	102 fm ✓	60° 32' 16.872" N 148° 34' 22.368" W	2747 ✓
102 fm	102 fm ✓	60° 32' 23.064" N 148° 34' 07.284" W	2741 ✓
138 fm	48 158.1 fm	60° 32' 13.632" N 148° 34' 09.516" W	50425 ✓
126 fm	133. ⁶ 9 fm	60° 32' 21.804" N 148° 33' 48.246" W	50367 ✓
34 fm	31. ⁷ 6 fm	60° 32' 54.204" N 148° 32' 54.264" W	3032 ✓
84 fm	83. ⁸ 7 fm	60° 32' 46.608" N 148° 32' 48.876" W	2714 ✓
139 fm	168. ² 3 fm	60° 32' 26.988" N 148° 33' 24.048" W	50308 ✓
100 fm	99.5 fm ✓	60° 32' 25.044" N 148° 34' 01.740" W	2739 ✓
200 fm	249. ⁴ 3 fm	60° 31' 31.620" N 148° 35' 35.556" W	3341 ✓

TABLE 1. Comparison of prior survey H-8491 with selected soundings from H-10781

H-8593	H-10781	Geographic Position	H-10781 Fix Number
83 fm	71.7 fm ✓	60° 30' 51.696" N 148° 32' 10.968" W	2329 ✓
44 fm	43.4 fm ✓	60° 30' 52.956" N 148° 31' 57.008" W	2019 ✓
75 fm	74.2 ³ fm	60° 31' 11.694" N 148° 30' 59.544" W	1239 ✓
36 fm	39.6 ⁷ fm	60° 31' 57.468" N 148° 28' 59.088" W	732 ✓
139 fm	170.4 ² fm	60° 32' 22.299" N 148° 28' 43.164" W	689 ✓
140 fm	137.4 ³ fm	60° 31' 11.676" N 148° 31' 29.748" W	1256 ✓
77 fm	73.5 fm ✓	60° 34' 04.800" N 148° 27' 46.044" W	3679 ✓
171 fm	237.7 ⁸ fm	60° 33' 56.898" N 148° 28' 03.340" W	3577 ✓
42 fm	44.8 fm ✓	60° 34' 08.040" N 148° 28' 24.426" W	3547 ✓
129 fm	129.5 ⁴ fm	60° 34' 00.660" N 148° 28' 38.424" W	3409 ✓
109 fm	101.8 ^{3 4} 142.0 fm	60° 34' 01.488" N 148° 27' 47.916" W	3678 110 ✓
131 fm	163.8 ^{3 4} fm	60° 34' 01.308" N 148° 28' 45.696" W	52061 ✓
151 fm	149.8 ⁷ fm	60° 33' 53.604" N 148° 29' 47.652" W	275 ✓
93 fm	87.6 fm ✓	60° 33' 43.668" N 148° 30' 51.804" W	3380 ✓
126 fm	174.8 ^{2 8} fm	60° 34' 00.000" N 148° 28' 30.000" W	52300 ✓
181 fm	213.8 ^{3 4} fm	60° 33' 55.008" N 148° 27' 53.640" W	52003 ✓
85 fm	76.1 ^{1 4} fm	60° 34' 04.056" N 148° 28' 12.780" W	136 3562 ✓
181 fm	231.8 ⁹ fm	60° 33' 55.404" N 148° 28' 12.432" W	3576 ✓
165 fm	250.2 ³ fm	60° 33' 56.376" N 148° 28' 12.432" W	50616 ✓
94 fm	79.8 ⁸ fm	60° 34' 08.256" N 148° 28' 48.972" W	187 ✓
151 fm	192.4 fm ✓	60° 32' 26.880" N 148° 28' 33.456" W	667 ✓
136 fm	135.1 fm ✓	60° 33' 33.120" N 148° 30' 54.648" W	584 ✓

TABLE 2. Comparison of prior survey H-8593 with selected soundings from H-10781

P. ADEQUACY OF SURVEY (See EVAL. RPT., Sec. P)

Survey H-10781 is complete and adequate to supersede prior soundings and features in their common areas. *Concur.*

Q. AIDS TO NAVIGATION ✓

No navigational aids exist within the survey area. *Concur.*

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 ✓

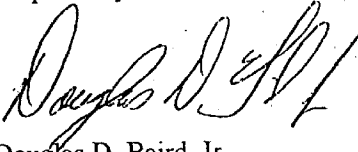
In areas where this survey duplicates coverage of survey H-10775, the hydrographer recommends that multibeam data be used for charting rather than the single beam HYPACK data, as previously recommended in Section M. The hydrographer has more confidence in the lower frequency multibeam data than in the single beam data, especially on deep and steep slopes. The multibeam system has more power, narrower beam width, and impinges on the bottom at a higher angle than does the single beam system, giving a more accurate return. *Concur with clarification. Depths between the present survey and H-10775 generally agree within 2-10 fathoms in depths of 100-250 fathoms, except in a few rough and extremely steep areas of the survey. There is no consistent shall bias with either surveys. The evaluator recommends compiling depths from H-10781 within the common area.*

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	December, 1997	N/CS26
Project related data for OPR-P125-RA	Incremental	N/CS34
Secchi Disk Observations for OPR-P125-RA	December, 1997	N/CS31

Respectfully Submitted,


Douglas D. Baird, Jr.
Lieutenant, NOAA

Approved and Forwarded,


Alan D. Anderson
Captain, NOAA
Commanding Officer

CONTROL STATIONS as of 1 Dec 1999 ✓

No	Type	Latitude	Longitude	H	Dist	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 BROAD
2		060:27:20.117	148:39:54.333	0	0	0.0	0.0	10/01/97	DDN DGPS
3		060:03:23.000	146:41:48.000	0	0	0.0	0.0	03/01/96	POTATO POINT USCG BROAD
4		060:39:13.513	147:58:26.500	13	0	0.0	0.0	00/00/00	ROCK

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: AZ **Registry Number:** H-10781
Sheet Number: RA-10-30-97

Survey Title: ENTRANCE TO KINGS BAY

Data Acquisition Dates: **From:** 20-Sep-97 263 **To:** 29-Oct-97 302

Vessel Usage Summary

VESNO	MS	SPLITS	DEV	XL	S/L	DP	BS	DIVE
2121	2	1	2	1	2	4		
2123	5	1	2	2	3	6		
2125							2	

Sound Velocity Cast Information

Launch Table #	Ship Table #	Cast DN	Max Depth	Position	Applicable DN
2		260	632	60/35/30	263,267
				148/10/20	
4		277	979	60/35/09	279 - 292
				147/44/27	
5		293	963	60/39/07	293 - 295
				147/44/49	
6		300	597.7	60/43/45	302
				147/50/30	

Tide Zone Information

Zone #	Time Corr.	Height Corr.
PWS41		X0.97

Tide Gage Information

Tide Gage #	Gage Name	Installed	Removed
945-4951	KINGS BAY	9/10/97	10/22/97
945-4818	BLUE FIORD	9/5/97	10/30/97
945-4794	APPLEGATE ISLAND	9/1/97	10/30/97

Statistics Summary

Type	Total:
BS	16
DEV	17.79
DP	14
MS	64.12
S/L	11.61
SPLIT	17.86
XL	17.26

Percent XL:	26.9%
SQNM:	4.8

APPROVAL SHEET

for

H-10781

RA-10-30-97

Standard field surveying and processing procedures were followed in producing this survey 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.

Approved and Forwarded,



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

GEOGRAPHIC NAMES

H-10781

Name on Survey	ON CHART NO. 16700-16705		ON PREVIOUS SURVEY		ON U.S. QUADRANGLE MAPS		FROM LOCAL INFORMATION		ON LOCAL MAPS		P.O. GUIDE OR MAP		RAND McNALLY ATLAS		U.S. LIGHT LIST	
	A	B	C	D	E	F	G	H	K							
ALASKA (title)	X		X													1
COXCOMB POINT	X		X													2
FALLING GLACIER	X		X													3
KINGS BAY	X		X													4
PRINCE WILLIAM SOUND (title)	X		X													5
TAYLOR GLACIER	X		X													6
																7
																8
																9
																10
																11
																12
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																25

Dennis J. Rasmussen
APR 29 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-10781

LOCALITY: Northwest Prince William Sound, AK

TIME PERIOD: Sep 24 - Oct 18, 1997

TIDE STATION USED: 945-4794 Applegate Island
Lat. $60^{\circ} 37.4'N$ Lon. $148^{\circ} 09.9'W$

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

TIDE STATION USED: 945-4818 Blue Fjord
Lat. $60^{\circ} 29.5'N$ Lon. $148^{\circ} 14.7'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.407 meters

TIDE STATION USED: 945-4951 Kings Bay Inside
Lat. $60^{\circ} 27.4'N$ Lon. $148^{\circ} 39.9'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.418 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: PWS40, PWS41 & PWS41A
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

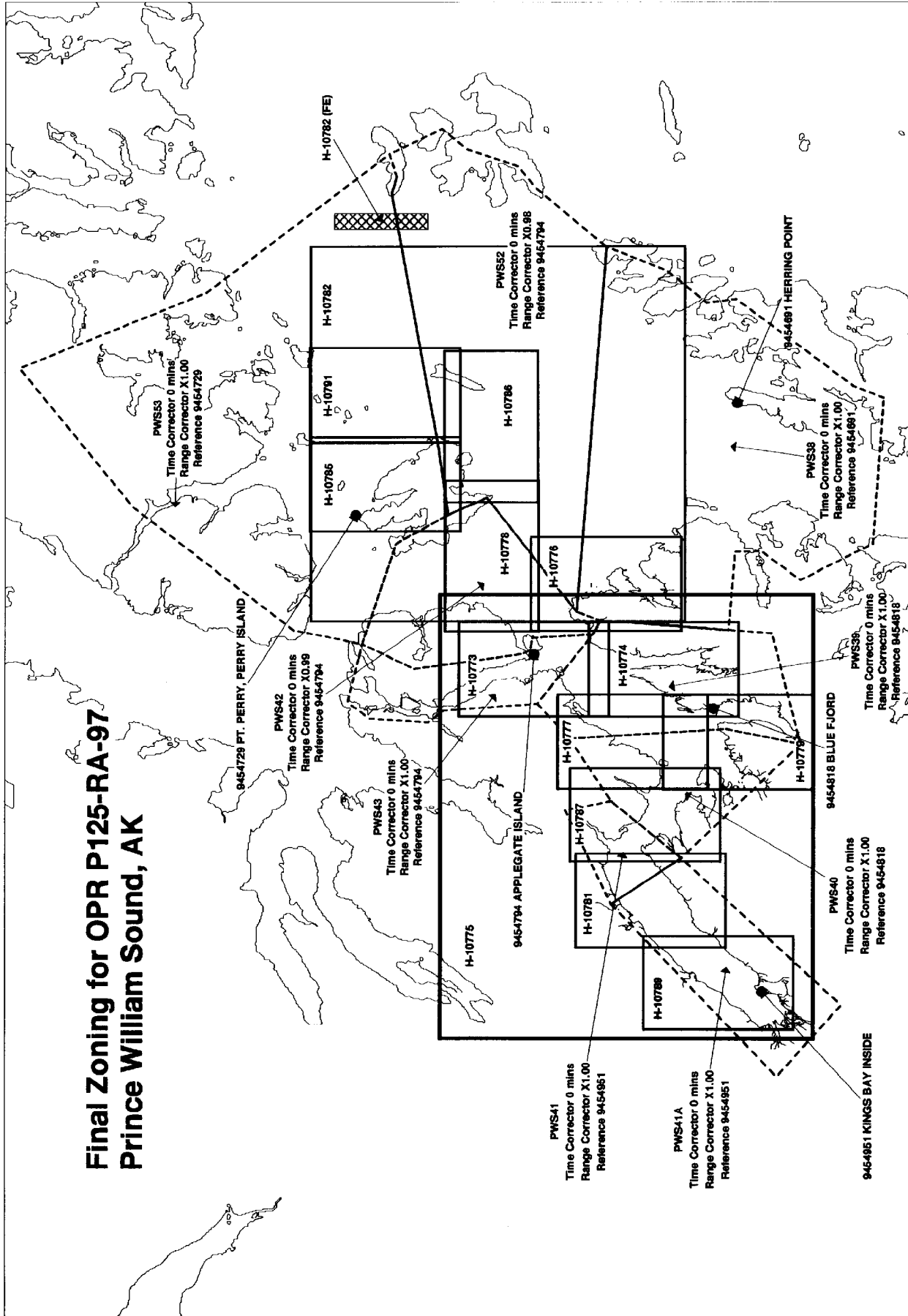


Final tide zone node point locations for OPR P125-RA-97,
Sheet H-10781.

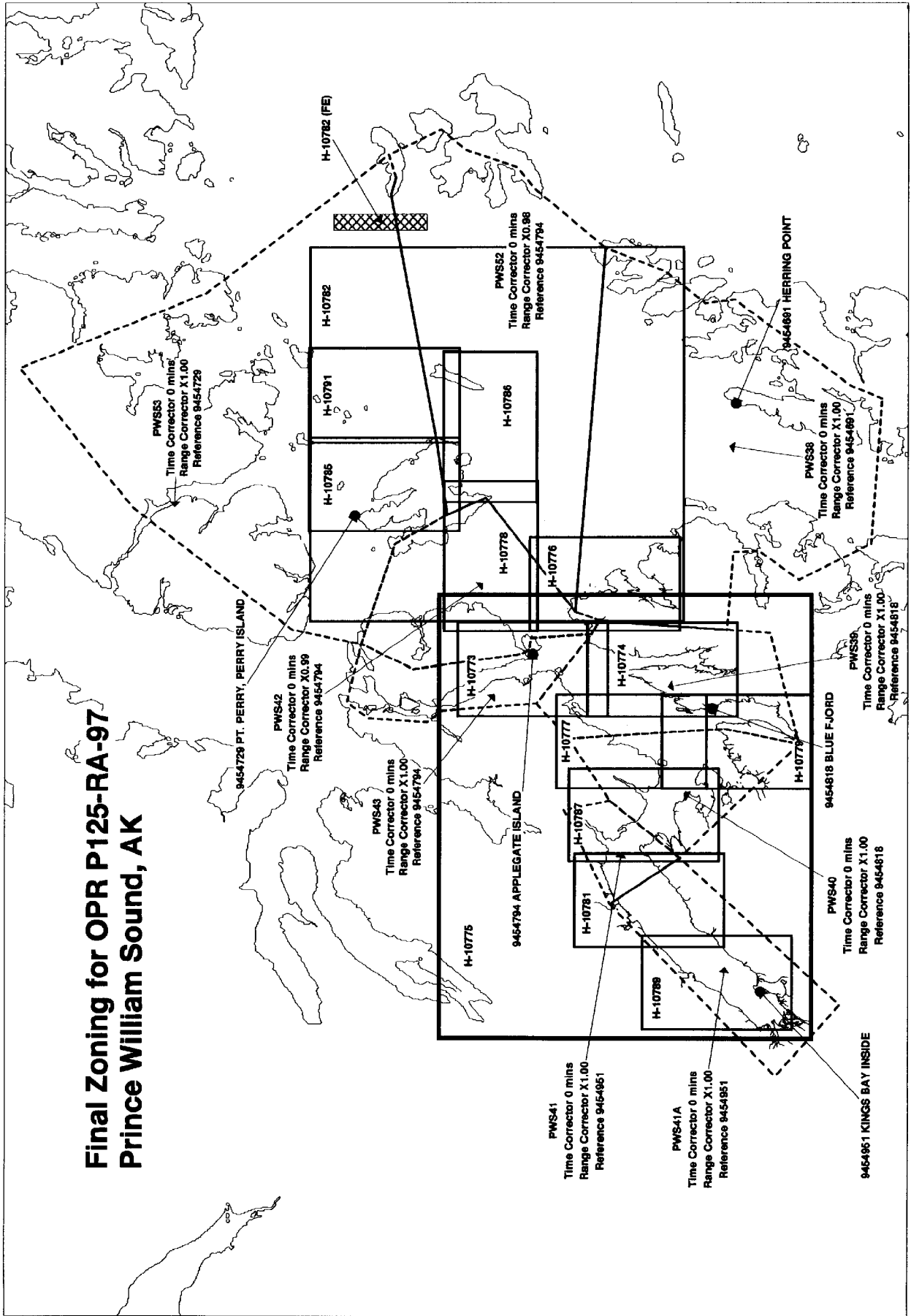
Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

		Tide Station Order	AVG Time Correction	Range Correction
Zone PWS40				
-148.288683	60.597501	945-4818	0	1.00
-148.380845	60.567284	945-4951	0	1.00
-148.466181	60.516083	945-4794	0	1.01
-148.296492	60.428791			
-148.274604	60.483349			
-148.288683	60.597501			
Zone PWS41				
-148.380845	60.567284	945-4951	0	1.00
-148.394499	60.600858	945-4818	0	1.00
-148.534449	60.567284	945-4794	0	1.01
-148.466181	60.516083			
-148.380845	60.567284			
Zone PWS41A				
-148.534449	60.567284	945-4951	0	1.00
-148.789986	60.446154	945-4818	0	1.00
-148.68369	60.398869	945-4794	0	1.01
-148.466181	60.516083			
-148.534449	60.567284			

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



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



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-16192, DM-10193
PHOTOBATHYMETRIC MAPS (List):	None
NOTES TO THE HYDROGRAPHER (List):	None
SPECIAL REPORTS (List):	None
NAUTICAL CHARTS (List):	16705, 17th Edition, September 27, 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 (selected)			
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	85.5		85.5
COMPARISON WITH PRIOR SURVEYS AND CHARTS		14.0	14.0
EVALUATION OF SIDE SCAN SONAR RECORDS			
EVALUATION OF WIRE DRAGS AND SWEEPS		28.5	28.5
EVALUATION REPORT			
GEOGRAPHIC NAMES			
OTHER* (Chart Compilation)		62.0	62.0
*USE OTHER SIDE OF FORM FOR REMARKS	85.5	104.5	190.0

Pre-processing Examination by M. Bigelow	Beginning Date 3/31/98	Ending Date 3/31/98
Verification of Field Data by M. Bigelow, D. Doles, E. Domingo, R. Mayor	Time (Hours) 85.5	Ending Date 10/8/98
Verification Check by B. Olmstead	Time (Hours) 12	Ending Date 11/16/98
Evaluation and Analysis by I. Almacén	Time (Hours) 42.5	Ending Date 10/8/98
Inspection by B. Olmstead	Time (Hours) 9	Ending Date 11/19/98

EVALUATION REPORT

H-10781

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. A page size plot of the charted area depicting the specific limits of supersession accompany this report as Attachment A.

The hydrographer has determined the inshore limits of safe navigation by defining a Navigable Area Limit Line (NALL) throughout the survey in accordance with the Project Instructions and the "limited" shoreline verification rules adopted by the ship during field survey operations.

The bottom consists mainly of mud and gravel. Depths range from 0 to 252 fathoms.

C. SURVEY VESSELS

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data was acquired in the field using HYPACK and processed with HPS. Office processing were accomplished utilizing the Hydrographic Processing System (HPS) and MicroStation 95.

Processed digital data for this survey exists in the standard HPS format, that is 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 which is not part of the HPS data set such as geographic names text, line-type data, and symbolization. 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 (MTM) projection and are depicted on a single 1:10,000 scale sheet.

E. SONAR EQUIPMENT

Side Scan Sonar was not used on survey H-10781.

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 the reduction of soundings during field processing. Actual tide reduction is derived from Blue Fjord, Alaska, gage 945-4818. Tide stations at Applegate Island and Kings Bay were listed on the approved tide note but were not used for final sounding reduction. Refer to the approved tide note attached to this report concerning recommended tidal zoning.

H. CONTROL STATIONS

The control stations used during this survey are adequately discussed in the hydrographer's report.

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: -2.266 seconds (-70.129 meters)
Longitude: 7.473 seconds (113.957 meters)

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

I. HYDROGRAPHIC POSITION CONTROL

Hydrographic position control is adequately discussed in the hydrographer's report.

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 maximum (HDOP) allowable limit has not been exceeded during this survey and the quality of data obtained is good. The reference site confirmation test and the daily 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 submitted to accompany the report.

J. SHORELINE

The shoreline maps DM-10192 and DM-10193 were compiled on NAD 83 and applied to this survey. Shoreline drawn on the smooth sheet in black originates from the above digital manuscripts as provided in digital format by the Coastal Mapping Program. The digitized shoreline files and the survey file were merged in MicroStation during the compilation of the smooth sheet.

There are no significant differences noted in the mean high water lines configuration between the present and the previously compiled shoreline. A few of the charted rocks were identified in the field to be either the offshore limits or the high points of the ledges located along the shore.

The hydrographer found several new rocks, not contained in the photogrammetric data. However, these features were not positioned hydrographically. Therefore, their locations are not recorded in the digital records. The rocks were transferred directly from the survey field sheet to the smooth sheet. The scaled positions are listed below:

<u>Feature</u>	<u>Latitude (N)</u>	<u>Longitude (W)</u>
Rock	60/34/13.5	148/28/21.4
Rock	60/34/13.2	148/28/20.1
Rock	60/34/12.8	148/28/21.3
Rock	60/34/20.2	148/28/38.6
Rock	60/34/17.9	148/29/18.5
Rock	60/34/17.3	148/29/19.6
Rock	60/34/15.3	148/29/30.9
Rock	60/34/14.8	148/29/33.5
Rock	60/34/12.5	148/29/42.0
Rock	60/34/12.0	148/29/47.4
Rock	60/34/02.2	148/30/35.3
Rock	60/33/26.5	148/32/26.2
Rock	60/33/26.5	148/32/27.6
Rock	60/33/26.2	148/32/28.8
Rock	60/33/17.3	148/32/44.5
Rock	60/33/16.9	148/32/43.2
Rock	60/33/16.5	148/32/43.6
Rock	60/33/15.8	148/32/47.4
Rock	60/33/14.9	148/32/46.7
Rock	60/33/13.7	148/32/47.6
Rock	60/32/47.1	148/33/37.6
Rock	60/32/47.3	148/33/40.2
Rock	60/32/35.4	148/34/20.0
Rock	60/32/34.8	148/34/21.8
Rock	60/32/33.9	148/34/23.2
Rock	60/32/32.8	148/34/28.9
Rock	60/32/32.2	148/34/30.9
Rock	60/32/32.0	148/34/32.4
Rock	60/32/30.6	148/34/38.5
Rock	60/32/29.8	148/34/40.2
Rock	60/32/14.2	148/35/15.1
Rock	60/32/13.6	148/35/15.8
Rock	60/32/11.0	148/35/20.0
Rock	60/32/08.9	148/35/22.7
Rock	60/32/07.1	148/35/25.6
Rock	60/32/04.7	148/35/31.1
Rock	60/32/00.7	148/35/39.4
Rock	60/31/59.7	148/35/41.3
Rock	60/31/51.9	148/35/55.1
Rock	60/31/50.6	148/35/56.9
Rock	60/31/45.8	148/36/05.6
Rock	60/31/45.3	148/36/06.6
Rock	60/31/44.6	148/36/06.9

Rock	60/31/29.9	148/29/49.9
Rock	60/31/29.2	148/29/51.1
Rock	60/31/28.5	148/29/52.3
Rock	60/30/53.2	148/31/26.6
Rock	60/30/52.1	148/31/28.8
Rock	60/30/49.8	148/31/32.8
Rock	60/30/49.6	148/31/35.6
Rock	60/30/49.4	148/31/45.2
Rock	60/29/52.3	148/34/33.9
Rock	60/29/28.1	148/34/58.3
Rock	60/29/27.6	148/34/59.4
Rock	60/29/27.6	148/35/00.8

The charted shoreline should be revised based on the latest shoreline map information and the results of the field shoreline verification as depicted on the smooth sheet.

K. CROSSLINES

Crosslines are discussed in the hydrographer's report.

L. JUNCTIONS

Survey H-10781 junctions with the following surveys.

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Area</u>
H-10787	1997	1:20,000	Western Limits
H-10789	1997	1:10,000	Eastern Limits
H-10775	1997	1:40,000	Midchannel Limits

The junctions with surveys H-10787 and H-10789 are considered complete. "Joins" notes have been added to the smooth sheet on each of the junctional areas of the survey. Comparison with these junction surveys is considered satisfactory, taking into consideration the rugged and steep bottom topography of the area.

The present survey junctions with multibeam survey H-10775 in depths ranging from 61 to 250 fathoms. Soundings from the multibeam survey generally differ with the single beam survey by about 2-10 fathoms particularly along the edges of the deep offshore portion of the bay. Several soundings were transferred to the present survey to delineate the depth curves within the common area. A "Joins" note has been added to the smooth sheet.

The random differences noted during junction comparison mentioned in the hydrographer's report normally occur around the rough and extremely steep area of the survey. These differences in depths could be attributed to the weak echo-sounder returns caused by the deep and rapidly changing profile of the bottom. Rescanning of fathograms during office processing reduced many of the larger depth discrepancies discussed in section L of the hydrographer's report.

M. COMPARISON WITH PRIOR SURVEYS

<u>Survey</u>	<u>Year</u>	<u>Scale</u>	<u>Datum</u>
H-7794	1948	1:40,000	Valdez
H-8491	1959	1:10,000	NAD 27
H-8593	1961	1:10,000	NAD 27

The prior surveys listed above cover the entire area of the present survey. Comparison of depths with the mean lower low water line (MLLW) to about thirty fathoms generally reveals differences of 0.5-2 fathoms with larger differences of 2-5 fathoms in depths ranging from thirty to fifty fathoms. The largest differences (10-50 fathoms) with the prior survey work are readily seen in depths exceeding fifty fathoms where the bottom is extremely steep. In all cases, the present survey reflects a deeper bias throughout the common areas.

The mean high water line (MHWL) throughout the survey area has remained unchanged except for an area centered at latitude 60/33/00N, longitude 148/33/30W. Prior survey H-8491 showed the shoreline approximately 350 meters further inshore of the recently compiled shoreline in the area.

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. Prince William Sound experienced bottom changes during the 1964 earthquake. However, due to the depths of water and the differences in data acquisition methods, no reasonable adjustment value for prior soundings could be determined.

A significant change in depths due to a suspected marine landslide off the SW entrance to West Finger Inlet in the vicinity of latitude 60/34/00N, longitude 148/28/00W, was noted during office processing. This particular area was noted to be 55 to 181 fathoms deep during the 1961 survey, while the recent survey shows depths of 100 to 252 fathoms within the same area. Although these differences in depths could also be attributed in part to the echo sounders performance over areas of steeply sloping bottom, this abrupt change in the bottom topography of the area could primarily be the result of the devastating Alaska earthquake of 1964.

The two (2) islets depicted on prior survey H-8491 with one charted at latitude 60/33/03N, longitude 148/32/55W, were not found during this survey and neither shown on the latest shoreline maps of the area. The area is presently depicted offshore of the MLLW line. These features, most likely moraine formations present during the 1959 survey were later dispersed and carried away with the movement of the glacier around the area. It is recommended that the presently charted islet be deleted.

The following charted features originating from the prior survey H-8593 were found farther inshore during shoreline verification and should be charted as depicted on the smooth sheet.

<u>Feature</u>	<u>Latitude (N)</u>	<u>Longitude (W) (NAD 83)</u>
Rock awash	60/34/18.0	148/29/17.0
Rock awash	60/34/07.0	148/30/30.0
Rock awash	60/34/01.5	148/30/35.0
Rock awash	60/33/58.0	148/30/50.0
Rock awash	60/33/48.0	148/31/40.0

The rock charted at latitude 60/33/59N, longitude 148/30/40W, originating from survey H-8593 was not found during this survey and should be deleted from the chart.

Aside from the effects of the natural shifting of the seafloor caused by earthquake, the differences noted during this survey could be attributed also to better sounding coverage, improved positioning and sounding methods including the application of modern data acquisition techniques. Additional information regarding prior survey comparison is found in the hydrographer's report, section M.

H-10781 is adequate to supersede the prior surveys within the area of common coverage.

N. ITEM INVESTIGATIONS

There were no item investigations conducted during this survey

O. COMPARISON WITH CHART

Survey H-10781 was compared with the following charts.

<u>Chart</u>	<u>Edition</u>	<u>Date</u>	<u>Scale</u>	<u>Datum</u>
16705	16th	Aug. 24, 1996	1:80,000	NAD83
16705	17th	Sept. 27, 1997	1:80,000	NAD83

a. Hydrography

Charted hydrography originates with the previously discussed prior surveys. The prior surveys have been adequately addressed in section M and require no further discussion. Comparison was also made with the 17th edition of the chart and no changes were noted between editions within the common area of the survey.

The compilation of charts from inshore survey H-10781 should take into consideration the significant overlap with offshore survey H-10775. Close examination indicates survey H-10781 has shoaler depths on the inshore area between 100 and 200 fathoms. Although the surveys are contemporary, they differ significantly in the type of technology employed to acquire depths. Discussion in the hydrographer's report reveals that depths greater than 250 fathoms originating from the multibeam survey better represents the true bottom configuration. The reasons for this are discussed in the hydrographer's report sections L and M. Charts covering the common area have been compiled using depths originating from H-10781.

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. Features from survey H-10781 have been generalized on chart 16705 along the shoreline where applicable.

Survey H-10781 is adequate to supersede charted hydrography within the common area.

b. Dangers to navigation

There are no dangers to navigation reported during this survey and no dangers were discovered during office processing.

P. ADEQUACY OF SURVEY

The hydrography contained on survey H-10781 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 following exceptions.

In the event that the field units submission of survey data will exceed four weeks from the 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 will forward their explanation through the Marine Center Director. Fieldwork for survey H-10781 was completed October 29, 1997 but not received for office processing until February 12, 1998.

Some anomalous soundings were acquired during this survey. They originate from the poor performance of the echo sounder on steep slopes, which were surveyed at excessive vessel speed. The hydrographer attempted to correct the problem by editing the raw sounding data, however, the quality of the echo sounder trace is so poor in some areas that the edits are likely based on judgement rather than quantifiable data. Office review of the problem has determined no corrective action can be taken to improve the quality of the trace. The judgement of the hydrographer has been generally accepted except in some few areas where soundings were edited during office processing. Generally, the affected depths are deep, in excess of 125 fathoms, and will have minor adverse effect on the quality of nautical charts if compiled at scales smaller than 1:40,000.

Q. AIDS TO NAVIGATION

Aids to navigation have been adequately addressed in the hydrographer's report. There were no features of landmark value found during this survey.

R. STATISTICS

Statistics are adequately itemized in the hydrographer's report.

S. MISCELLANEOUS

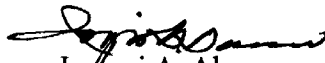
Miscellaneous information is adequately discussed in the hydrographer's report.

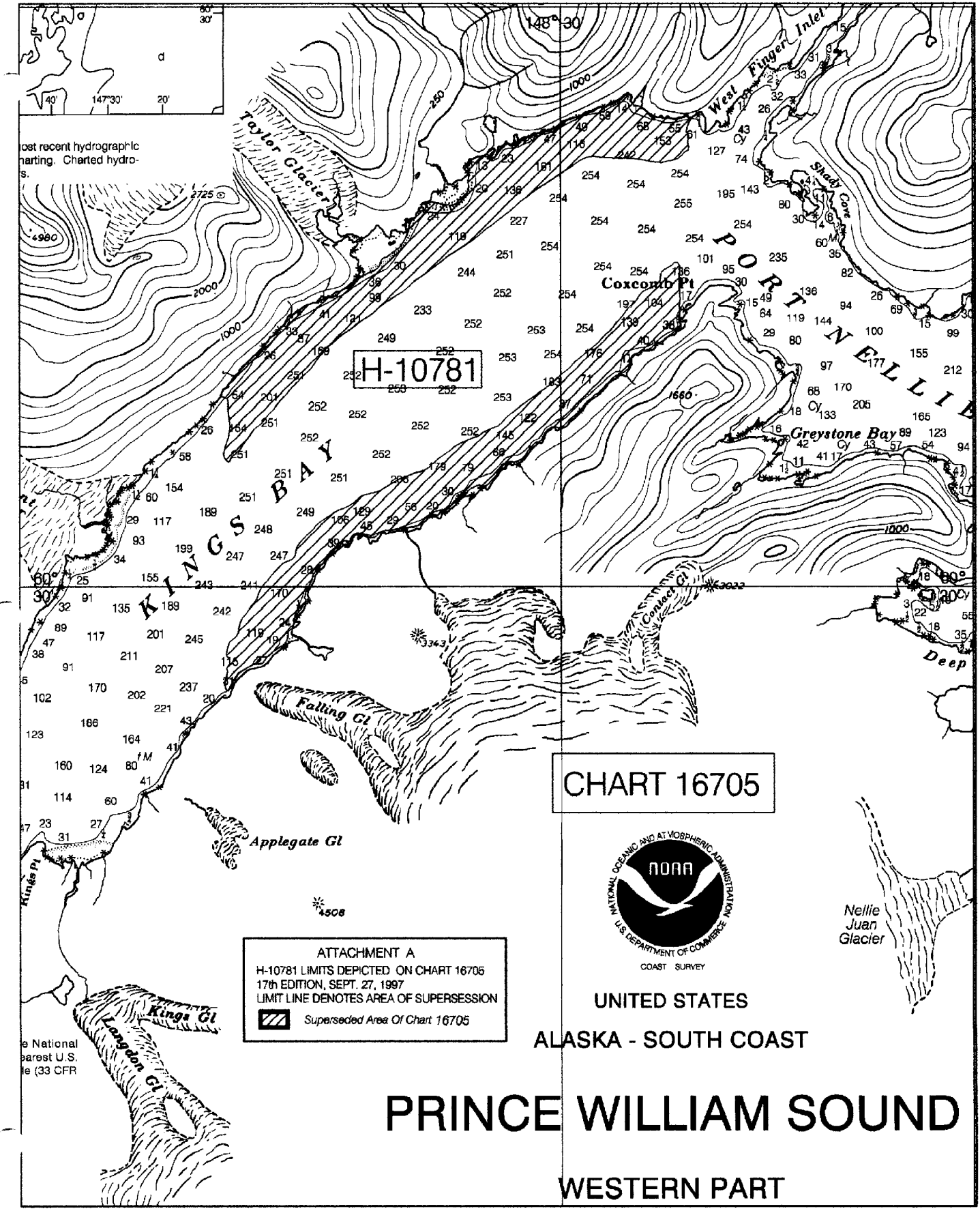
T. RECOMMENDATIONS

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

U. REFERRAL TO REPORTS

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

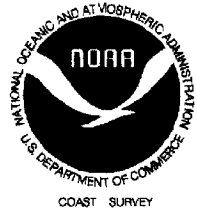

Isagani A. Almacen
Cartographer




Most recent hydrographic charting. Charted hydro-

H-10781

CHART 16705



ATTACHMENT A
 H-10781 LIMITS DEPICTED ON CHART 16705
 17th EDITION, SEPT. 27, 1997
 LIMIT LINE DENOTES AREA OF SUPERSESION
 Superseded Area Of Chart 16705

UNITED STATES
ALASKA - SOUTH COAST

PRINCE WILLIAM SOUND
WESTERN PART

the National
 nearest U.S.
 the (33 CFR

APPROVAL SHEET
H-10781

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: 11/19/98
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: 12/14/98
James C. Gardner
Commander, NOAA
Chief, Pacific Hydrographic Branch

Final Approval

Approved:

Andrew A. Armstrong III Date: Jan 29, 1999
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10781

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
16705	10/1/98	<i>Reginald A. Almond</i>	Full Part Before After Marine Center Approval Signed Via <i>Full application of</i> Drawing No. <i>soundings & features from smooth sheet.</i>
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
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